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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and to improve the character of the service rendered to the public.

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ANNUAL REPORT LIGHT-HOUSE BOARD.

SALARIES OF LIGHT-HOUSE KEEPERS.

On March 3, 1901, Congress appropriated \$785,000 for salaries, fuel, rations, rent of quarters where necessary, and similar incidental expenses, of not exceeding 1,600 light-house and fog-signal keepers and laborers attending other lights, for the fiscal year ending on June 30, 1902. On June 30, 1900, there were 1,243 light-stations; on June 30, 1901, there were 1,306; on June 30, 1902, it is believed there will be 1,316, and on June 30, 1903, it is expected that there will be 1,326 light-stations in operation. It is reasonable to suppose that Congress will make appropriations for additional light-houses, which the Board has recommended should be built. The Board has recommended the establishment of a number of fog-signals at numerous existing stations, and it is probable that the number will be increased at the next session of Congress. It will be necessary to employ another keeper at each station to which a fog-signal is added. The Board therefore recommends that it be authorized to employ not exceeding 1,700 light-house and fog-signal keepers and laborers attending other lights, if needed, and that an appropriation of \$833,000 be made therefor.

Congress appropriated \$475,000 to defray the expenses of light-vessels during the fiscal year to end June 30, 1902. The appropriation will barely meet the needs of the service during that time. There are now 45 light-vessels on stations and 8 light-vessels held in reserve ready in case of need to be put on stations to take the place of those for the time being under repairs. Three light-vessels are being built. The Board has asked that appropriations be made for building four more. It costs about \$5,000 a year to maintain a first-class light-vessel. The wear and tear on the older vessels increases with their age, and it costs more each year to keep them in repair. While the new light-vessels, when built, are fitted with all the modern improvements, the Board is fitting certain of the older light-vessels with fog-signals and like improvements to bring them up to its present standard. The cost of labor and material is largely increased since last year. The Board estimates therefore, the expenses of light-vessels for the ensuing fiscal year will be at least \$525,000, and it is recommended that an appropriation to that amount be made therefor.

Congress appropriated \$550,000 to defray the expenses of buoyage during the fiscal year to end on June 30, 1902. It is estimated that the same amount will be required to defray the expenses of buoyage during the coming fiscal year. The Board therefore recommends that an appropriation of \$550,000 be made for that purpose.

As stated last year, the limited appropriation for this purpose has not permitted the general renovation and improvements that are so much needed in this important class of aids to navigation, though considerable progress has been made. Improved apparatus has been installed at several stations, preserving the system of interchangeability be-

tween the various members of the duplicate sets of apparatus required in each case. The Board is of the opinion that the change from the old-style steam engine, which consumes a great deal of steam, to the Crosby automatic engine, which operates by clockwork and consumes steam only for winding the clock and opening the valve, is desirable and should be made, at least as rapidly as the old engines become unserviceable; that the replacing of steam boilers by some form of explosive engine with an air compressor is desirable for all stations where the water supply is precarious, and may perhaps be found advantageous by experience in all cases when the present installation of steam boilers becomes unserviceable; that in view of the probability that steam will be replaced by compressed air quite generally for fog-signals, it is not desirable to enter at once upon any considerable expenditure for perfecting the installation of steam boilers.

The average time of getting up steam with the old style of boilers is about forty-five minutes. With heaters kept properly tended this time can be greatly reduced with a small expenditure of coal. The importance of raising steam quickly is such that it is proposed that heaters be attached to all fog-signals operated by steam.

It is estimated that \$190,000 will be required for all expenses connected with fog-signals, and it is recommended that an appropriation of that amount be made therefor:

The three appropriations of \$300,000 made by the acts approved March 3, 1899, June 6, 1900, and March 3, 1901, were barely sufficient to maintain the post lights which had already been established, but they were insufficient to enable the Board to establish and maintain other lights, which it is evident are much needed. It is estimated that \$330,000 will be needed to defray the expenses of lighting rivers during the next fiscal year, and it is recommended that an appropriation of this amount be made therefor.

The Board also recommends appropriation be made for building a steam life vessel for Martins Reef, Lake Huron; a reef life vessel for the ninth and eleventh light-house districts.

The Board also renews its recommendations of last year for the construction of a steam tender for use in St. Marys river and adjacent waters, Michigan. In consequence of the increased commerce passing through this river, and the great necessity for keeping its aids to navigation in the best possible condition, an iron steamer, drawing not more than 6 feet of water and a special steamer bow for ice crushing is required.

ECONOMY OF OCEAN LINERS.

Improved economy in the oversea transport of commerce is being sought for now in the greater size of cargo steamers, the fuel consumption of which does not increase in the same ratio as the cargo capacity. This point is illustrated in a diagram prepared by James McKechnie, the engineering director of the Vickers' Company, which shows that the displacement of the ship does not increase in quite the same proportion as the deadweight carried, the immersed midship area increases at a slower rate than the load displacement, and the power necessary for a given speed advances at a correspondingly lower ratio. Thus, a ship to carry only 5,000 tons requires machinery of 3,475 indicated horse-power to propel her at 13 knots; while, in the case of a ship of treble the capacity, the power is scarcely double. In other words, the consumption of coal per hundred ton-miles in a now relatively small ship taking 5,000 tons of cargo, is eight pounds, while the vessel taking 16,000 tons uses only 4.4 pounds per hundred ton-miles, the rate of consumption per unit of power per hour being assumed in all cases at 1.5 pounds. Not only is the fuel consumption per ton carried less, but the first cost per ton carried need not be greater, the working expenses per ton generally are lower, because mechanical means are introduced more freely for many purposes, while the personnel does not increase pro rata with size. This greater economy is the cause of the steady growth in the size of ships. The total number of vessels of over 10,000 tons in existenceten years ago, was two; now there are 51, of which ten are over 13,000 tons. Ten years ago there were only 91 vessels which exceeded 5,000 tons register; at the end of last year there were 505. This higher economy of the larger ships is, as shown by Mr. McKechnie, being widely recognized. Germany maintains her position with Britain so far as large ships are concerned.—The Canadian Enquirer.

WESTERN IRRIGATION.

The latest press bulletin of the division of hydrography of the United States geological survey points out the fact that the future of large tracts of arid lands in the west, amounting to many millions of acres, depends largely on the use made of the streams flowing through them. Whether they shall remain in their present unproductive and uninhabited condition, or become the homes of thriving populations and centers of business activity, is almost wholly a question of the fullest and most economical use of their available water supply. Irrigation has been practiced for years on portions of these lands and proved its value beyond question, but the development of more land demands the use of more water, and especially the considerable amount of water which the older method of irrigation could not control, and which is allowed to run to waste. This waste water represents a large and important acreage for reclamation from an arid state, if only the means are found to make use of it. Part of it is to be found in the spring freshets, part in the water that has sunk beneath the stream's gravel bed, and part, already used for irrigation, which has worked its way so far below the surface as to be beyond the reach of vegetation.

Engineers are alive to the necessity of saving the waste and using over and over again as much of the streams' flow as possible, so as to extend the reclamation line to its utmost limit. Hence the storage of water on the upper portions of the streams is being studied, storage by the cultivation of forests about their headwaters, storage by snowfall, and storage by means of dams and reservoirs. Attention is also being directed to electricity as a help in economizing the use of water. The electric current is generated in the mountainous portions of the watersheds. It is then conducted to the lowlands and made to pump up again the water once used for irrigation which has sunk too low to moisten the crops, or wells are dug in the river gravels and the water usually to be found there pumped up for use on the farms.

Not only are the streams to be more fully used, but the underground waters are to be reached, and both artesian and ordinary wells made to furnish their very considerable flow of water.

The one idea in the arid west seems to be to use to the utmost all the water to be had in the most economical way, so as to put the largest possible acreage under cultivation. It is interesting to note that many of the recent papers of the series of the Water Supply Papers, published by the United States geological survey, which are written by experts, descriptive of the use of the water supply all over the country, openly or by inference point to the fullest conservation of the country's water as an approaching future necessity.

FOR A TRAINING STATION ON THE LAKES.

As a result of Secretary Long's letter to Senator Hale, of the Senate Naval Committee, in favor of a naval training station at some point on the Great Lakes, which we published on Jan. 11, a strong effort is being made to secure such a station on the Peninsula of Presque Isle, near Erie, Pa. Rear Admiral Henry F. Pickens Garrison, No. 4 of the Army and Navy Union, at Erie, has taken an active interest in the matter, and a bill for the establishment of a naval station has been drawn up by the adjutant of the garrison and introduced as a joint resolution in the Senate and House by Mr. Penrose and Mr. Bates respectively. In addition to establishing a naval training station at Presque Isle, the bill provides for the raising of the sunken hull of Commodore Perry's historic flagship, Niagara, sunk near by at Misery Bay, and for its preservation at the naval station.

The harbor of Erie and Presque Isle is four and one-half miles long and from 3,500 to 7,500 feet wide, with a depth up to 27 feet, and is generally conceded to be one of the best natural harbors on the Great Lakes. The peninsula of Presque Isle, now under charge of the War Department is about six miles long and from 300 to 7,000 feet in width, situate on the north side of the harbor of Erie, and extends out a distance of two and one-half miles into Lake Erie, making a safe harbor, as the prevailing winds are from the west. Erie harbor has been for more than half a century, the naval home port of the United States steamer Michigan, the only recruiting vessel stationed on the lakes.



DETROIT.

Special Correspondence to The Marine Record:

A revision in colors, of Coast Chart No. 3, Lake Erie, has just been issued and is now on sale at the U. S. Lake Survey Office, 33 Campau building, Detroit, Mich., at 15 cents per copy.

The ice blockade in the St. Clair ship canal has lowered the water in Lake St. Clair about five feet and the water has receded from the shore for over half a mile. Farmers living along the shore are compelled to walk out half a mile for their supply of water. The water in Detroit river past the city is 27 inches lower than normal.

Plans for improvement of the government harbor of refuge at Sand Beach, to cost \$300,000, are now being made by the government engineer here. The entire crib work above the water will be replaced with stone and concrete, and this work will extend over two miles. The harbor will be dredged to a uniform depth of twenty feet.

The following meteorological observations are furnished by the office of the U. S. Weather Bureau, Detroit, for the week ending Feb 4th. Prevailing wind directions for the week, northeast; highest velocity, 36 from the west at 2:05 p. m. on the 4th. Mean temperature for the week 17 degrees; highest temperature 29 degrees on January 21; lowest, zero, on February 3.

The annual meeting of the stockholders of the Detroit & Cleveland Navigation Co. was held here on Tuesday. The following officers and directors were elected: President, James McMillan; vice president, James H. McMillan; secretary, Philip McMillan; treasurer and general manager, Wm. C. McMillan. The directors are the officers and George M. Hendrie and James McGregor of Detroit.

Col. Lydecker, Corps of Engineers, U. S. A., accompanied by Maj. Bixby, the new United States engineer at Detroit has gone to the "Soo," where Col. Lydecker will show the major over the work that is to be done next summer in the vicinity of the "Soo," for the improvement of navigation. The work which Col. Lydecker had ahead of him is so vast and intricate that he is spending a good deal of time showing his successor over the ground, and Col. Lydecker will probably not go to Cincinnati for some time yet.

Considerable opposition against the proposed government control of navigation in the lower part of the Detroit river is being expressed. It is backed by the passenger lines, which do not wish the speed of their ships to be restricted. It is expected that the opposition will find voice among the Michigan Congressmen in opposition to the bill introduced by Congressman Minor, of Wisconsin. This bill directs the Secretary of the Treasury to provide suitable rules and regulations governing the movements and anchorages of vessels in the Detroit and St. Clair rivers, and to enforce such regulations he is authorized to detail one or more revenue cutters for duty in these rivers.

Denny Lynn of Port Huron, who is well known at all the lake ports, met with a serious accident at Detroit Saturday, while waiting to board a suburban car. The trolley pole on a passing car suddenly broke off and fell to the street, striking Mr. Lynn in the head and rendering him unconscious. At Harper hospital, where he was removed, in an ambulance, it was found that he had sustained a severe scalp wound and was suffering from concussion of the brain. Subsequently Mr. Lynn was removed to the home of his old friend, Detective Pat O'Neil, No. 304 Fourth street. There he was placed in the same room with his brother, George E. Lynn, who is suffering from pneumonia.

Government officials do not see the necessity of maintaining a revenue cutter at the Limekiln Crossing. The revenue cutters on the lakes at present have plenty to do and could not be used for the purpose contemplated. It would seem sufficient to have a couple of cheap lookout stations, and a fast launch or yacht constantly at hand and ready to be utilized to overhauled the lawbreakers. After all, said an official, that is all a revenue cutter could do under the circumstances. I don't believe any law would give a cutter the right to run down or fire upon a boat for violation of such a rule as is to be enforced down there. The launch could get the name of the boat offending, and the matter could then be brought before the proper officers for action.

On Tuesday, the annual meeting of the new Detroit and Buffalo Transit company, was held in this city. Aside from the election of officers and directors, among whom are several prominent Clevelanders,

no business of importance was transacted. The following officers were elected: President, George Hendrie; vice president, Thomas F. Newman; treasurer, W. C. McMillan; assistant treasurer, George M. Black; secretary, B. C. Wilder. Directors—W. C. McMillan, George Hendrie, F. S. Masten, Calvary Morris, Harvey D. Goulder, T. F. Newman, A. C. Angell, B. C. Wilder and A. A. Schantz. William C. McMillan was appointed general manager. The new officers elected were: B. C. Wilder, A. A. Schantz and George M. Black.

A story is in circulation that the Pere Marquette railway will soon acquire the Lake Erie and Detroit River railroad. The road originally ran from Walkerville to Ridgetown, Ont., on the north shore of Lake Erie, but has been extended to St. Thomas and London, Ont., a total distance of 210 miles. It also owns and operates the line formerly known as the Erie & Huron, running from Sarnia to Rondeau, a distance of 125 miles. It is said that Fred H. Prince, a heavy stockholder and director of the Pere Marquette living in Boston, is arranging to acquire a large amount of Detroit & Lake Erie securities, both stocks and bonds. It is also stated that the Pere Marquette officials have recently inspected the line. If the program is carried out a car ferry will be established between Port Huron and Sarnia.

The Sandwich docks of the Pittsburg Coal Co., will be given a general rebuild between this time and the opening of navigation next spring, and when the work has been finished the docks will be as complete as any on the lakes. Two new clam shell scoops will be put in, the shoots will be repaired and made higher, new tramways will be put in and the channel at the rear of the dock will be deepened and widened. In addition to this, sheet piling will be put in all around the dock, about 900 feet altogether, the dock will be widened ten feet on the back and the largest class of steamers will be able to make the dock without difficulty. The channel will be between sixty and seventy feet wide and have eighteen feet of water. An effort will be made to make the Sandwich dock one of the fastest on the lakes and the installation of the clam shells will be along the line of other docks putting in labor saving devices.

The annual report of C. H. Westcott, supervising inspector of steam vessels for this district on the lakes showed that 6,179,893 persons were carried by Detroit steamers from Jan. 1, 1901, to the same date of 1902. These do not include the passengers brought into the city by the D. & C. and White Star, Northern Steamship Co., and other lines which touch at cities where there are government stations, but is a record principally of people who have taken passage at Detroit. The only exception is with the boats of the ferry company, of which a report is taken both going and coming. Chicago, with its 2,000,000 population, only shows 487,442 travelers by steamboat during the year; Marquette, 415,940; Grand Haven, 758,091; Milwaukee, 400,438; Port Huron, 617,113. Forty-seven pilots and 66 engineers and 16 masters and pilots were licensed during the year in Detroit. Supervising Inspector Westcott's report was submitted to the chief of the department at Washington in due course.

Col. Lansing Beach, in charge of harbor improvements and lighthouses in the Lake Huron district, is making plans for the improvement of the harbor of refuge at Sand Beach. The cribs that form the breakwater have been going slowly to ruin, and the extraordinary heavy sea that sets in there has had the effect of tearing the upper parts badly. It is proposed to replace the entire crib work above water with stone and concrete, and this work will extend over a couple of miles. Sediment and clay have also formed in the harbor, making a great many shoal spots, and a dredge will be placed at work to make a uniform depth of 20 feet. There is an appropriation of \$300,000 for the work at present, but more will probably be needed before the work is completed. Next season the number of dredges at work making a deep channel at the entrance to Sebawaing river at the east side of Saginaw bay will be doubled, as the river, near its mouth, is becoming more important as a point of navigation.

The Great Lakes Towing Co., Cleveland, has given an order to the Jenks Ship Yard, of Port Huron, for a new steel wrecking lighter. She will come out in June, this year, which statement is taken as extraordinary, seeing the crowded condition of the yards. The Jenks people happened to have a berth of that size open, and could fit the lighter in without inconvenience. The possession of this lighter, which will be stationed in the Detroit river, will give the Great Lakes Towing Co. about a complete mastery of the lake dredging situation. She will measure 173 feet over all, 36 feet beam, and 15 feet in depth. She will have a carrying capacity of 1,500 tons when loaded to eleven feet. She will be fitted with an "orange peel" ore lifting device, which will be able to take from any boat about fifty tons an hour. According to the amount of ore which it is necessary to lighter from most boats in order to free them, it is expected that this lighter will be able to get them afloat inside of a day. The lighter will be stationed in the Detroit river, to be in easy reach of the vessels which go aground at the Limekiln Crossing.

The court of claims has decided in favor of the crew of the Yosemite in its demand for bounty money for sinking the Spanish ship Antonio Lopez in the harbor of San Juan, in June 1898. The amount asked for was

\$50,000 and the court at Washington handed down a decree for that sum. The court in its finding decided that the Yosemite had fought against a superior force, and was therefore entitled to double the amount paid in cases where the enemy in inferior, as in Dewey's battle at Manila. Besides the Lopez, the Yosemite fought a cruiser and three gunboats. The court decided that for every man on the Spanish ship the Yosemite crew should get \$200. The complement of the Lopez was figured at 250 men. While this amounts to a judgment against the government, there is no certainty when the claim will be paid. It will be necessary first of all to get an appropriation, and an effort is being made to get the claim into the urgent deficiency bill. The sum allowed will be divided among the officers and men according to the pay they received. The officers, of course, will get the lion's share. It is thought that the division will give each man about two months' pay, which, among the rank and file of the crew, would range from \$32 to \$48. About forty members of the naval reserves from this city will receive sums amounting to about two months' pay probably something like \$50 apiece.

PORT HURON.

Special Correspondence to The Marine Record:

The barge Racine is in the lower drydock undergoing repairs.

Nelson Mills will fit up the tug Harley as a ferry boat to run between Stag Island and Marysville.

R.F. Thompson has purchased the tug Castle, of A. D. Bennett. He will take the boat to the "Soo."

The indications are that considerable vessel property will change hands in this district before navigation opens.

Capt. R. P. Thompson paid A. D. Bennett \$9,500 for the tug Castle. Mr. Thompson has refused \$12,500 from parties in Georgian Bay who are very anxious for a tug of her class.

Colin McLachlan says there is no truth in the report published in the Detroit papers to the effect that he had purchased a new boat to take the place of the Kittie Forbes, recently sold.

Since the resignation of Thomas Lomasney as deputy United States marshal at this point, the name of Duncan Bradbeer has been prominently mentioned. Mr. Bradbeer has the time and ability to discharge the duties of the office.

A marine engineer gives it as his opinion that the engineers employed by the steel trust and recently ordered to their boats will return home within two weeks. The managers of the trust merely wanted to make the calling out of their engineers at this time of the year a test case.

The Captains' Wives Club held a very interesting meeting at the residence of Mrs. Dan Sinclair on Tuesday afternoon last. At the close of the meeting Mrs. H. Zealand on behalf of the club presented Mrs. Henry Davis with a handsome gold watch and chain as a token of esteem previous to her return to Milwaukee.

Some time ago Charles A. Bailey, of the Treasury Department, seized two naphtha launches belonging to Wm. Bedford and George Roberts, of Roberts' Landing. Special Treasury Agent Burton Parker spent a number of days in Port Huron, and vicinity last week, and it is understood will recommend to the Treasury Department that the boats be returned to the owners. Just what evidence the treasury agent secured is not known, but it is claimed that the facts were misrepresented to the officials when the seizure was made.

The tug trust is to have a strong competitor in Robert P. Thompson and there is every appearance that Mr. Thompson has sufficient backing to purchase an outfit which will affect business of the trust. On Wednesday Mr. Thompson purchased the tug W. B. Castle from A. D. Bennett and a deal has been about closed for the purchase of a lighter. Mr. Thompson will go to Bay City in a few days to close a deal for a new tug, or if suitable arrangements can be made, a tug will be purchased at that port. It is his intentions to have an outfit at the "Soo" and also one in this city. The only man engaged in the wrecking business outside of the tug trust at the present time is Capt. James Reid and it is claimed by marine men that vessel owners outside of the steel trust prefer to hire anti-trust outfits when they can be secured.

A project is under way for a new line of ore carriers, to ply between Lake Superior ore docks and Point Edward and Sarnia, in connection with the Grand Trunk railway system. The Hamilton (Ont.) Steel & Iron Co. is interested in the enterprise, and if the present negotiations are successful, the new fleet will carry ore for the company's smelting furnaces at Hamilton. Mr. Horace Wilcox, of the company, and Mr. McKay, of the Hamilton Steamship Co. together with Grand Trunk officials, have been the past two days inspecting the wharf facilities at Sarnia and its northern suburb, and have expressed themselves as well satisfied with the facilities that could be provided. If the project is carried through, steam apparatus will be provided to load ore at once on to the cars out of the holds of the vessels. The making of Sarnia the lower lake terminal for this line would furnish employment, it is estimated, to about fifty or eighty men.

CLEVELAND.

Special Correspondence to The Marine Record.

Capt. W. E. Morris will sail the steamer William F. Sauber, the coming season.

Mr. Fred Saal and Mr. Chancy Morgan will be with the Pittsburgh Coal Co. in the fuel department this season.

Capt. H. A. Pierce, who was in the steamer W. F. Sauber last season, will sail one of the steel steamers of the Mitchell fleet this year.

Capt. C. L. Hutchinson, the general manager of the fleet of boats operated by Hutchinson & Co., has returned home after a month or better part of it spent in the Southwest. During his absence he went over Mexico and spent some time in Texas.

The twenty-first annual ball and reception will be given by the Marine Engineers' Beneficial Association No. 2, of Cleveland, at the Chamber of Commerce auditorium, on Friday evening, February 7th, at which time all our friends and patrons are requested to be present, as a good time is assured. The committee has spared neither pains nor expense to make the affair a success. Costello's full orchestra will furnish music for the occasion.

Aside from a few steamers that have been tied up for lump sums in the ore and package freight trades no chartering has been done for the coming season, but the ore trade is in such shape that the freight question may be taken up at any time. All the dealers have made sales and enough business along that line has been done to take care of considerable tonnage and fix season rates, but there is no disposition on either side to rush matters.

The annual meeting of the Cleveland & Buffalo Transit Co., was held at Rockport, on Tuesday. Messrs. M. A. Bradley, T. F. Newman, George W. Gardner, George W. Avery, R. C. Moody, Harvey D. Goulder and D. C. Shurmer were re-elected directors. A meeting of the directors will be held in a few days, when the old officers will be re-elected. They are M. A. Bradley, president; George W. Gardner, vice-president; T. F. Newman, secretary and general manager, and R. C. Moody, treasurer.

The following shipping masters have been appointed for the coming season: A. R. Rumsey chief shipping master, Cleveland; William Wall, assistant shipping master, Cleveland; J. W. Hanson, chief shipping master, Chicago; Gordon Ratteray, assistant shipping master, Chicago; L. T. Rumsey, shipping master, South Chicago; William Jamson, shipping master, Milwaukee; Edward Nesbit, shipping master, Buffalo; Charles Fisher, shipping master, Conneaut; William Dibble, shipping master, Ashtabula; Patrick Mitchell, shipping master, Toledo.

Edwin S. Mills, the assistant general manager of the Pittsburgh Steamship Co., who has been sick for the last three months or more, most of which time he was in a hospital, left here this week for California. His condition has so improved that he may now travel with safety and has been ordered to take a change of climate in order that he may recover more rapidly. He is accompanied by his brother, J. R. Mills, the manager of sales of the Carnegie company here. E. S. Mills will remain West until spring, but his brother will return in three or four weeks.

It is not likely that there will be any trouble between the vessel men and the marine engineers the coming season. While the owners have not given the matter much thought, and want the work of fitting out put off as long as possible, some of the managers think that the schedule adopted by the Marine Engineers' Beneficial Association is about fair. The matter will no doubt be settled without any trouble. Several managers have practically made arrangements with their men for the coming season, but the Pittsburgh Steamship Co. is the only firm that has given out appointments.

A dispatch from Washington says: The supervising inspectors of steam vessels have completed their annual session in Washington. Several changes were made in the regulations affecting traffic on the lakes. One provides that hereafter when a steamer and a consort come to anchor a red light must be placed at both the bow and the stern of the consort, so that other vessels will have a warning not to run over the tow line and foul the wheel. Another is that in case of danger the signal shall not be "several short whistles," but "five or more." Another change is to allow the local inspectors to examine at lake ports lake engineers who desire a license for ocean vessels instead of going to an ocean port for the examination.

Work on installing the new clam shell ore unloading machines on the Pennsylvania railroad docks at Ashtabula has been started. The machines are being erected by Webster, Camp & Lane, of Akron. The docks on which the new machines will stand will be strengthened by new piling and new cribs. The new clam shell machines for Laks Shore dock No. 5 are now being built by the United States Steel Corporation in Chicago. In pattern they will be like those in use in Chicago. As soon as completed they will be erected. They may be ready by May 1. Although not given out, indications point to the erection of an immense new coal machine at Ashtabula by spring. Several acres of valuable lake front property have recently been purchased. It is thought that the Lake Shore is the purchaser, and that the new coal machine will be for Pickands, Mather & Co., of this port.

Another steamer has been added to Cleveland's list of vessels and several other deals are on that may be closed

during the next week. Mr. W. H. Becker has bought the wooden steamer W. H. Wolf, from the West Division Steamship Co., of Milwaukee, of which David Vance is manager. The price paid for the ship was \$65,000, and she was purchased subject to inspection. The Wolf was built at Milwaukee in 1887 by Wolf & Davidson. She is 285 feet keel and 42 feet beam. Her gross tonnage is 2,265 tons. A new company will be organized to operate the Wolf. Mr. Becker figured with the American Ship Building Co. and the Jenks Ship Building Co. for 5,000-ton steel steamer, but as a ship of that class could not be delivered until quite late next season, he decided to buy. Other boats that may change hands are the steamers C. F. Bielman, Uganda, Thomas W. Palmer and William Livingstone.

The steamer Minnetonka, built on the order of the American Navigation Co., which is headed by Charles E. and W. F. Peck, of New York, at the old Globe yards of the American Ship Building Co., has been put into drydock to be cut in two. She was too long to be sent to the coast, for which trade she is intended, and it was necessary to cut her in two to get her through the Welland canal and the St. Lawrence system of canal locks. This work is now being done in one of the dry-docks. She will have bulkheads in each half, and the sections will be towed to Montreal, where they will be put together in a yard provided near Quebec. The steamer is 443 feet 6 inches over all, 430 feet keel, 43 feet 7½ inches beam, and 33 feet molded depths. She has a carrying capacity of 7,000 tons. The canals she will have to lock through will accommodate boats no more than 260 feet according to plans of construction.

Two big steel freighters were launched at lake shipyards on Saturday last. At the local yards of the American Ship Building Co., the steamer W. H. Gratwick, building for the Etna Steamship Co., of which Capt. John Mitchell of this city is manager, was launched. The Gratwick is one of four steamers building for the companies managed by Capt. Mitchell. The new ship will cost \$260,000. She is 436 feet over all, 416 feet keel, 50 feet beam and 28 feet deep. She will have triple expansion engines, with cylinders 22x38x53 inches, with 40-inch stroke. Steam will be furnished by two Scotch boilers, 13 feet 2 inches in diameter and 11½ feet long, to be allowed 170 pounds pressure. On 18 feet draft of water the Gratwick will carry 6,200 gross tons. The steamer W. W. Brown, the second of the steamers building for the United States Transportation Co., and named for the manager of the company was launched at South Chicago. She is 366 feet over all, 346 feet keel, 48 feet beam and 28 feet deep. She will cost \$220,000, and on 18 feet of water will carry 4,800 tons of freight.

CHICAGO.

Special Correspondence to The Marine Record.

The Chicago Press Association has elected as its president, Homer J. Carr, manager of the Lake Marine News Association.

E. V. Clergue, brother of F. H. Clergue, and a member of the Clergue Syndicate, at Sault Ste. Marie, and manager of the Algoma Central and Manitoulin and North Shore railways, died at Chicago, Jan. 16th.

The steel steamer Kearsarge of Pickands, Mather & Co.'s fleet has been chartered for the season by the Canada-Atlantic Transit Co. The price was not given out. The Kearsarge will trade between Chicago and Depot Harbor and Capt. R. McDowell will sail her. This makes the third season that the Kearsarge has been chartered by the Canada-Atlantic line.

Alexander Currie, who retired last week as chief engineer of the steamer Naomi, of the Crosby line, and who had been engineer on that one steamer for over 20 years, has the reputation of having made more trips on one boat than any other man on the lakes. He made 6,300 trips on the Naomi across Lake Michigan, traveling in the aggregate, over 535,500 miles.

The grain trade shows very little life and there is probably less tonnage under charter for storage and spring delivery than there has been at any time for many years. At Milwaukee there has been very little chartering done and at Chicago and the head of Lake Superior it is figured that there is not more than 3,000,000 bushels of grain afloat. There is plenty of grain in sight, but sales are very slow. Duluth has upwards of 13,000,000 bushels and the Chicago elevators have in store about 22,000,000 bushels.

The Marine Iron Works, of Chicago, have displayed noteworthy energy in erecting modern buildings to replace those that were destroyed in the recent fire. The new buildings and equipment are greatly superior to the old and include the highest grade of modern machinery, so that it is believed to be the most efficient plant of its kind for high grade marine engines, boilers, launches, tugboats and dredges that it is possible to product in the present state of the industry. The fire of last September destroyed every building of the old plant.

The convention of delegates from the various branches of the Lake Seamen's Union in this city, after having been in session for a week, has not yet perfected all its plans for the next season's campaign. Resolutions were adopted protesting against the bill introduced in Congress by Representative Hepburn, December 18, 1901, for the purpose of changing the name of the United States

marine hospital service to United States Health Service. The resolutions recite that the old name has been in use for over 100 years and has always served the purpose, while the proposed name would only result in trouble and confusion. Chairman William Penje stated that the other matters being considered by the convention relating to sailors' wages and the deck-hands' union, had not yet been disposed of.

That the bridge at Washington street will have to go by order of the War Department is the current report in marine circles. The first official news of the order will, of course come from Washington, but enough has come from the United States engineer's office to make marine men feel certain that the engineer has advised the removal of the bridge. The United States engineer is investigating the plans for winding basins, recently laid before the house committee on rivers and harbors by James B. Galloway. It is likely that some changes will be made in these plans which will result in large savings to the government, without destroying the efficiency of the turning places in the south branch. With the combined work of the drainage board and the general government in improving the south branch, vessel men will be amazed at the improvements to be made in that important waterway.

No word has yet been received at the offices of the Canada Atlantic or Rutland Transit companies, of the sale of these properties to the Vanderbilt interests. From inside information it is to be learned that the Canada Atlantic line will be continued, but nothing can be learned regarding the fate of the Rutland Transit Co. In one shape or another the line between Chicago and Ogdensburg has been in operation over thirty years and its discontinuance now would be of much inconvenience to shippers who have been engaged for many years in supplying New England customers by that route. If the line is given up, it will be the practical end of traffic from Chicago through the Welland canal, and so lessen the receipts of the Canadian waterway that the Dominion government might as well abolish tolls and throw the canal open to all the world, the same as the Americans have done with their canals.

In the total tonnage of arrivals and clearances, Chicago ranks fourth among the principal ports of the world, leading all but London, New York, and Hamburg. The figures for the year ending on Dec. 31, 1900 (except in the case of New York, for which the figures for the fiscal year ending June, 30, 1900, are given), are as follows: London, 16,529,085 tons; New York, 16,020,290 tons; Hamburg, 14,198,817 tons; Chicago, 14,186,100 tons; Antwerp, 13,573,472 tons; Liverpool, 11,818,000 tons; Marseilles, 9,629,114 tons. So far as the United States is concerned, Chicago leads all ports except New York in tonnage, and leads even that port in the number of arrivals and clearances, the annual report showing 17,017 for Chicago and 14,019 for New York. It handles more than three times the tonnage of Boston, almost four times the tonnage of Philadelphia, and more than four times the tonnage of Baltimore. In the thirty years since 1870 this tonnage has more than quadrupled.

Edward Hines, who bought 80,000,000 feet of lumber in Marinette last week at an estimated cost of \$1,500,000, is one of the most prominent figures in the lumber trade of the United States. Last year it was his ambition to handle more lumber than any other firm in the United States or the world for that matter. He succeeded, for last year the Hines Lumber Co. bought and sold 250,000,000 feet of white pine lumber, something unparalleled in the history of the trade. This year he intends to accomplish the same task and is in a fair way to maintain the remarkable prestige of his concern. He made an excellent start by buying 80,000,000 feet in Marinette, the pick of Menominee river stock, and will increase his holdings at Ashland, Superior, Duluth and other points. Isaac Baker is his right hand man in all these big deals. The company has a fleet of fourteen boats and a yard with two miles of water frontage in Chicago. Jesse Spalding was formerly the chief financier of the concern, but he sold out sometime ago to the Weyerhaeusers.

Word comes from Ludington that workmen are busy unloading the partial cargo of barley which was on the Pere Marquette steamer No. 3, when that vessel met with her unfortunate mishap outside of Ludington harbor about two weeks ago. As the cargo is being removed the steamer is straightening up and presents less of the appearance of a wreck than she did when first brought inside the piers. The barley is being hoisted from the boat's after compartments in buckets and loaded upon freight cars, where it will remain for the present. Capt. Reid, who released the steamer, denies statements which have been made concerning the damage done to the steamer's upper works by the wreckers. He declares the vessel's cabins and upper works were damaged beyond repair before the wrecking crew commenced operations, and also says that his men were careful never to cut away a timber making an opening unless such action was thought necessary to save the steamer from greater damage. The work was done under the supervision of representatives of the insurance companies and owners. Capt. Reid declares that the steamer is far from being beyond repair, and that she will be nearly as good as new when she comes out of drydock at Milwaukee next spring. Representatives of the Pere Marquette railway say that there was no truth in the rumor that the owners were intending to abandon No. 3 to the insurance companies.

AN ENGINEER'S VIEW.

Col. H. M. Chittenden, a distinguished officer in the Engineer Corps of the United States Army, makes a strong plea in the February number of the North American Review for "Government Construction of Reservoirs in the Arid Regions." Col. Chittenden illustrates the vast importance of this subject by showing that the region which might be brought into a condition of cultivation by the use of the available supply of water, would maintain, under successful irrigation, as great a population as that of the United States in 1900. To utilize the available water supply in the arid regions, provision must be made for storing it, and the question arises, Shall the reservoirs be constructed by public or private agencies? The latter, Col. Chittenden argues, will rarely have sufficient resources, and when that is not the case any reservoirs made by private agencies will be built so as to satisfy merely the purposes of the investment, and not to secure the full capacity of the site. As between the States and the General Government, the duty of constructing the reservoirs is essentially interstate in character. The Government is, furthermore, the principal land-owner in the West, and the present resources of most of the States would debar them from undertaking such works. Col. Chittenden calls attention to an anomaly in connection with the appropriation of money for public purposes:

In reporting to the House of Representatives the Rivers and Harbors Bill at the last session of Congress, the committee having the bill in charge took occasion to animadvert severely upon the fact that a large portion of the appropriations for the Missouri River in recent years has gone to the protection of property along the banks, instead of improving the channel of the river for purposes of navigation. Yet the works of protection are of far greater public utility than those for improving the channel of the river. The navigation of the Missouri, wonderful as it was in its day, is dead beyond the slightest hope of resurrection. But during the process of its decay the fertile bottom lands have become farms and gardens among the richest in the world. The river in its reckless career plays havoc with these lands, and every year destroys property by the thousands. There is no power that can properly protect these lands but the general government, for the protective works invariably extend beyond the property lines of the individual, and often beyond the jurisdiction of the town, city or State in which the property lies. There is no duty of the government more deeply grounded in justice than that of protecting property holders from the ravages of this public watercourse. And yet, if any member of Congress were to ask for an appropriation for this specific purpose, his request would be summarily rejected, although, more likely than not, he will get the money if he pretends that it is for navigation."

THE GROWING IMPORTANCE OF HOISTING MACHINERY.

The increasing importance of hoisting machinery is evidenced by the number of new firms that have taken it up, and by the growth of the industry in the United States, France, Germany and Belgium. Many firms now make a specialty of some type or types of cranes; others manufacture anything that offers. But outside of these there are firms doing other and an entirely different class of work who also undertake the construction of cranes of exceptional massiveness or for special purposes. There seem to be as many crane makers now in the United States and in Germany as in Great Britain, and though many of the German and French cranes have an outre appearance to us, and may certainly have weak points, that does not apply to all, perhaps not to the majority, and many are very excellent examples of this class of work.

The growing importance of some classes of hoisting machinery is scarcely grasped by the older crane makers or users. Nearly all the older types of hoisting machinery are certain to be affected by the advent of the new, in which everything is reduced to the most slender proportions consistent with the actual strength required—steel sections, wire rope, and light trolleys taking the place of heavy castings; massive framings, rigid iron rods, and heavy crabs. The differences in dead loads and in speeds attained are great, and are wholly in favor of the new cranes. Add to this the fact that electric driving is adopted in these to a far greater extent than it is yet in the older, more solidly built types of cranes, and we have a set of conditions immensely in favor of the new. The differences are greater even than those between the modern electric traveler and the older square-shaft type, which it has so suddenly and almost completely displaced in new installations.

Great Britain was first in the field in the manufacture of hoisting machinery, and there it attained a high stage of development. When the Americans began to manufacture this class of machinery for themselves they started with no preconceived notions or prejudices, and American hoisting machinery is, therefore, different in many respects from British. Now under the circumstances just what might have been expected to occur—knowing the American character—has happened. Having a clean slate, they started to make machinery which should give the shortest cut to the results desired; hence the originality of many of their designs. And in machines which bear much resemblance to those made in Great Britain they have gone on more or less original lines in the working out of details.—Joseph Horner, in Cassier's Magazine for February.

MONTHLY SHIPBUILDING RETURNS.

TREASURY DEPARTMENT, OFFICE OF THE COMMISSIONER OF NAVIGATION, January 31, 1902.

The Bureau of Navigation reports 74 vessels of 22,796 gross tons were built in the United States and officially numbered during the month of January, 1902, as follows:

	WOOD.				STEEL.				TOTAL.	
	SAIL.		STEAM.		SAIL.		STEAM.			
	No.	Gross.	No.	Gross.	No	Gross.	No.	Gross.	No.	Gross.
Atlantic and Gulf.....	29	6,014	18	1,062	1	1,651	5	6 698	53	15,425
Porto Rico.....										
Pacific.....	7	3,821	6	1,164			1	2,036	14	7,021
Great Lakes.....	1	12	1	30					2	42
Western Rivers.....			4	166			1	142	5	308
Total.....	37	9,847	29	2,422	1	1,651	7	8,876	74	22,796

The largest steel steam vessels included in these figures are the El Alba, 4,614 gross tons, built at Newport News, Va. Southern Pacific Co., owners; Spokane 2,036 gross tons, built at San Francisco, Cal., Pacific Coast Co., owners.

LOCAL AND ASSISTANT INSPECTOR OF HULLS.

STEAMBOAT INSPECTION SERVICE, MARCH 4-5, 1902.

The United States Civil Service Commission announces that on March 4-5, 1902, an examination will be held at the places mentioned in the accompanying list for the position of local and assistant inspector of hulls in the Steamboat-Inspection Service.

The examination will consist of the subjects mentioned below, which will be weighted as follows:

Subjects.	Weights.
1. Letter-writing..... (Third grade)...	10
2. Arithmetic.....	10
3. Hull construction.....	20
4. Pilot rules and inland navigation.....	20
5. Lifeboats and liferafts.....	10
6. Sea navigation.....	10
7. Experience.....	20
Total.....	100

Information relative to the scope of the examination may be found in sections 37 and 162 of the Manual of Examinations, revised to January, 1902.

Age limit, 25 to 55 years.

From the eligibles resulting from this examination it is expected that certification will be made to the position of inspector of hulls in the steamboat-inspection service, Jacksonville, Florida, at a salary of \$1,500 per annum, and to other similar vacancies as they may occur.

This examination is open to all citizens of the United States who comply with the requirements. Competitors will be rated without regard to any consideration other than the qualifications shown in their examination papers, and eligibles will be certified strictly in accordance with the civil service law and rules.

Persons who desire to compete should at once apply to the secretary of the local board of examiners at the places mentioned in the accompanying list, or to the United States Civil Service Commission, Washington, D. C., for application form 1087, and a copy of the Manual of Examinations.

The application should be properly executed and filed with the Commission at Washington prior to the hour of closing business on February 24.

AIDS TO NAVIGATION.

Congress authorized, by act approved on February 15, 1893, the establishment of a number of light-stations at an aggregate cost of nearly half a million dollars, but made no appropriation at that time for their construction. Since then from time to time, appropriation has been made for the erection of many of them. The following is a list of the light-stations relating to the lakes now remaining for which no appropriation has yet been made, with the maximum amount which each may cost:

Fairport Harbor fog-signal, Ohio.....	\$ 4,300
Lorain Harbor (Black River) fog-signal, Ohio....	4,300
Sand Hills Light-House, Michigan.....	20,000
Bayfield light and fog-signal, Wisconsin.....	5,000
Pats (or Hat) Point light and fog-signal, Minnesota	15,000
Little Gull Island light and fog-signal, Michigan..	20,000
Peshtigo Shoal, Green Bay, Wisconsin.....	10,000
Wilson Harbor light, New York.....	2,500

VESSEL PASSAGES AT DETROIT, MICH.

The following report of the vessel passages through the Detroit River is furnished through the courtesy of Postmaster F. B. Dickenson, Detroit Mich.: Total passages during April, 7; May, 2,002; June, 3,222; July, 3,298; August, 3,254; September, 2,892; October, 2,928; November, 2,405; December, 526; total for the season, 20,534. This is 2,107 less than in 1899 and 1,931 less than in 1900.

Daily weather maps, wind direction and velocity reports, and storm warnings were delivered promptly to the vessel masters by the marine post office during the season of navigation. The special p. m. wind reports from stations on the lakes were furnished each night to vessel masters passing Detroit.

SIGNS AND WEATHER.

The following extract is from the editorial page of the Ithaca, N. Y., Herald, for November 15, 1901, under the above heading:

"The Weather Bureau has predicted a hard winter, and the present early snowfall would indicate that the prediction is to be fulfilled. But lake sailors recall a winter several years ago when the Bureau predicted severe weather that did not materialize, and they declare that certain signs and omens show that the winter is to be a mild one."

It is not understood how the editor above quoted could have been so completely misled as to the purpose and work of the United States Weather Bureau.

It has never yet attempted to forecast the weather for a season in advance, and does not anticipate doing so in the near future.

Neither is it aware of any other reputable meteorological service that is attempting such forecasts, with the possible exception of the Indian Meteorological Office, which is investigating the relation between the variations in the number of sun spots and the occurrence of droughts in India.

In general, seasonable forecasts have been undertaken by prophets of the Hicks or Wiggins type only, or by would-be scientists who read the weather from the signs of the moon or of the stars. Many farmers have professed to be able to forecast the character of the coming winter from the thickness of the husks on the ears of corn, and hunters make like forecasts based upon the character of the breast bone of the goose, and the early or late southward migration of birds.

We have every reason to expect that forecasts of this character will continue to be made for many years to come, or at least until the public in general has learned to distinguish between science and superstition, facts and fancy.

Meanwhile the Weather Bureau will devote itself to the study of meteorology and the laws governing the generation and propagation of storms. It will endeavor from day to day to forecast the probable course of such storms as make their appearance upon the weather map, and to foretell the weather changes that will occur in different parts of the country as a result of the storm movements. With these daily forecasts we must be content until the science of meteorology is more fully developed.

The intelligent daily press of our land has been of inestimable value in disseminating the forecasts of the Bureau among the people whom they are intended to benefit. The public will be still further its debtor if it will join hands with the Weather Bureau in an effort to eradicate from the popular mind the many fallacies that have no foundation in fact, but are a survival of traditions handed down from some past generation when scientific knowledge was confined to a few.—Monthly Weather Review.

THE SHIP SUBSIDY BILL.

It sometimes happens that in response to the question, "What's in a name?" we have to answer, "Just everything." There is now up for discussion in Congress a measure which we do not hesitate to designate as one of the most important ever brought before that body, that is in danger of suffering shipwreck simply and solely because of the unfortunate name that it carries. Unfortunately a large number of the American people have conceived a violent prejudice against the term "subsidy." Apparently they look upon subsidizing as a kind of alms-giving, a sort of feudal scattering of largess, with the difference that the recipients, instead of being supposedly impoverished and helpless, are among the powerful and wealthy of the land. As a matter of fact, shipping subsidies mean nothing of the kind. They are based upon the conviction that between the individual ship-owner and the nation at large there is, in respect of the upbuilding and extending of the shipping industry, with all the indirect and enormous national benefits that are to be derived therefrom, a profound community of interest. It is realized that the assistance given by the nation to the ship-owner is to be temporary only, and that in its intrinsic value it is altogether disproportionate to the great and lasting national advantages to be derived from the rehabilitation of the merchant marine.

SHIPBUILDING.

During 1901, exclusive of war ships, 639 vessels of 1,524,739 tons gross (viz., 591 steamers of 1,501,078 tons and 48 sailing vessels of 23,661 tons) have been launched in the United Kingdom. The war ships launched at both Government and private yards amount to 41, of 211,969 tons displacement. The total output of the United Kingdom for the year has, therefore, been 680 vessels of 1,736,708 tons. These totals are analyzed in the tables which are given below, but the following notes will also be of interest. In these notes, war ships are excluded from consideration except where they are specially mentioned.

As regards both merchant ships and war ships, the output of the year in the United Kingdom has surpassed all previous records in Lloyd's Register. The returns of mercantile tonnage launched in 1899 and 1900, which were themselves unprecedented, have now been exceeded by 108,000 tons and 82,000 tons respectively. For warships, the highest total hitherto reported, viz., 191,000 tons, which was reached in 1898, is 20,000 tons less than the figures for 1901.

The output of 1901 is almost entirely composed of steam tonnage. In 1889, 10 per cent. of the output was composed of sailing tonnage. For the four following years 1890 to 1893, the proportion rose to 19 per cent. After that period, the construction of sailing vessels rapidly declined, until in 1899 sailing tonnage formed less than 0.14 per cent. of the output. During 1900 and 1901 there has been some recovery, and the percentage of sailing tonnage now stands at 1.5 per cent.

As regards the material employed for shipbuilding purposes in 1901, it is found that over 99.8 per cent. of the tonnage has been built of steel.

Of the total output, 1,149,306 steam tons and 18,496 sailing tons, or 1,167,802 tons in all (nearly 77 per cent.) belong to ports in the United Kingdom. In this connection it may be noted that the losses etc., of United Kingdom vessels during twelve months are shown by Lloyd's Register Wreck Returns to average 279,000 tons (205,000 steam, 74,000 sail). Sales to foreign and colonial owners for the twelve months ended November, 1901, reached a total of 404,000 tons (330,000 steam, 74,000 sail). On the other hand, purchases from foreign and colonial owners during the same period amounted to 58,000 tons (45,000 steam, 13,000 sail). The sailing tonnage of the United Kingdom would thus appear to have decreased by about 115,000 tons, while the steam tonnage has increased by 659,000 tons. The net increase of the United Kingdom tonnage during 1901, is therefore about 543,000 tons. This figure exceeds all similar estimates since 1892. For the last three years the estimated increases were as follow:—1898, 327,000 tons; 1899, 313,000 tons; 1900, 220,000 tons.

In 1901, as in 1900, about 23 per cent. of the total output has been built to the order of foreign and colonial shipowners, as compared with 19 per cent. in 1899, 22 per cent. in 1898, and 25 per cent. in 1897. As was also the case in 1899 and 1900, Germany has this year provided the largest amount of work for British shipbuilders, 22 vessels of 83,432 tons (nearly 5.5 per cent. of the total output) having been built for that country. Austria-Hungary follows with 20 vessels of 64,374 tons. Next comes Holland with 61,888 tons; the British Colonies with 28,569 tons; Russia with 25,684 tons; and France with 20,609 tons.

The annual shipbuilding statistics of Lloyd's Register during recent years have illustrated the steady tendency toward the construction of vessels of large tonnage. In 1892, 37 steamers were launched in the United Kingdom of 4,000 tons and above; in 1895, 50; in 1898, 83; in 1900, 125; and in 1901, the number has risen to 140. Among these last are eight vessels exceeding 10,000 tons, viz:

Tons gross.	Tons gross.
Celtic..... 20,904	Noordam 12,340
Minnetonka..... 13,400	Rijnland 12,302
Walmer Castle..... 12,570	Haverford 11,635
Athenic..... 12,500	Merion 11,635

Three sailing vessels over 3,000 tons have been launched in the United Kingdom during 1901, viz.:

Tons gross.	Tons gross.
Brilliant..... 3,765	Comet 3,014
Daylight..... 3,700	

Of the principal shipbuilding centres of the country, Newcastle takes the lead, showing an output of 292,989 tons. Then follow in order Glasgow 274,606 tons, Sunderland (268,069 tons), Greenock (163,816 tons), Middlesbrough (161,058 tons), Hartlepool (150,607 tons), and Belfast (149,705 tons). In war ship tonnage the leading ports stand thus: Glasgow (60,200 tons, London (30,815 tons), and Barrow (26,700 tons).

The returns for the year under view include 82 steam trawlers and other fishing vessels; 54 dredgers, barges, etc.; 13 yachts; 19 tugs; 3 vessels intended to carry oil in bulk; and other vessels designed for special service.

Of the vessels launched in the United Kingdom, 510 of 1,282,966 tons have been built under the Society's inspection with a view to classification in Lloyd's Register Book.

As regards the movements of the shipbuilding industry during the course of 1901, Lloyd's Register Returns show that, irrespective of warships, the total tonnage under construction in the United Kingdom on the 31st of December, 1901, exceeded that under construction twelve months previously by about 89,000 tons, or 7 per cent. At the close of 1900, 1,269,919 tons (1,256,119 steam, 13,800 sail), were

being built. The returns for the March and June quarters of 1901 showed an increase of rather more than 30,000 tons on the December figures; and the returns for the September quarter (1,414,120 tons), showed the highest figures recorded in the history of the shipbuilding industry. At the present time 1,359,205 tons (1,327,702 steam, 31,503 sail) are under construction in the United Kingdom. It should be added that the amount of warship tonnage under construction in the country is now smaller than it has been since December, 1897. The highest total recorded by Lloyd's Register was reached in March, 1900, when 454,000 tons displacement were in hand. The total is now 330,000 tons.

Attention is drawn to the statistics given in table V., from which it appears that there have been built abroad, during the year, 446 steamers of 800,849 tons and 453 sailing vessels of 291,951 tons, in addition to 82 war vessels of 255,000 tons displacement. Among foreign countries, the three leading places are held by the United States of America (433,000 tons), Germany (218,000 tons), and France (177,000 tons).

Of the mercantile tonnage reported from the United States, a considerable proportion does not affect the general commerce of the world, being intended for service on the Great Lakes. As showing the size of vessels employed in that trade, it may be mentioned that sixteen steamers have been built for it during 1901 of upwards of 4,000 tons each. On the coast, fourteen steamers of over 4,000 tons each, two steel sailing vessels each about 3,300 tons, and six wooden sailing vessels of over 2,000 tons each have been launched in 1801.

Germany has launched the following steamers of large tonnage, viz.:

Tons gross.	Tons gross.
Kronprinz Wilhelm. 14,908	Moltke 12,372
Blucher..... 12,372	

No very large sailing vessels are included in the output of Germany during the year, but it may be noted that a steel five-masted ship of 5,200 tons is being built on the Weser under the survey of Lloyd's Register.

In France, the construction of large steel sailing vessels has continued to flourish under the influence of bounties granted by the State. Forty-nine such vessels, of 2,000 tons and upwards, have been launched during the year under review. The largest of these is the Leon Blum, of about 3,200 tons, built near Rouen. Some expansion is noticeable in the construction of steamers in France, the output being 53,000 tons in 1901, as compared with only 20,000 tons in 1900.

In Italy, the mercantile output of the year is 60,500 tons. There has been a considerable reduction in the tonnage on the stocks during the last two years. In December, 1899, the tonnage in hand amounted to 107,000 tons; in December, 1900, to 87,000 tons; it has since fallen to 61,000 tons.

If to the figures in Table V. be added those for the United Kingdom, as given in the preceding tables, the total output of the world during 1901 (exclusive of war ships) appears to have been about 2,617,000 tons (2,302,000 steam, 315,000 sail). Lloyd's Register Wreck Returns show that the tonnage of all nationalities totally lost, broken up etc., in the course of twelve months amounts to about 746,000 tons (361,000 steam, 385,000 sail). It would thus be seen that, while the sailing tonnage of the world has been reduced by about 70,000 tons during 1901, the steam tonnage has been increased by about 1,941,000 tons. The net increase of the world's mercantile tonnage is, therefore, 1,871,000 tons.

Compared with this net increase for the world, the net increase of 543,000 tons, as stated above, for the United Kingdom is equivalent to 29 per cent. In the net increase of the world's steam tonnage, viz., 1,941,000 tons, the United Kingdom has shared to the extent of 659,000 tons, or 34 per cent. Of the new tonnage launched during 1901, the United Kingdom has acquired nearly 45 per cent.

INTERNATIONAL CODE SIGNALS.

TREASURY DEPARTMENT,
BUREAU OF NAVIGATION,
WASHINGTON, D. C. January 25, 1902.

To collectors of customs, masters of vessels, and others:

As stated in the Code list published by this office for 1901, the new international code of signals came into use on January 1, 1901. From January 1, 1901, to January 1, 1902, the new edition of the code and the old edition were to be used concurrently, but from January 1, 1902, information was given that the new edition alone would be used.

It now appears that the British Board of Trade has decided that, while it is to be assumed in all cases that the new code will be used on and after January 1, 1902, if signalmen in any case can not make out a signal by the new code and find it translatable by the old code, they are not to refuse to receive it.

Similar action may be taken by the United States, and signals in such cases made from vessels according to the old code may be received and reported.

It is suggested that the fact that the old code has been used by a vessel be brought in each case to the attention of the Bureau of Navigation, Treasury Department.

A copy of this circular should be posted at each custom-house for the information of masters and other persons concerned.

E. T. CHAMBERLAIN, Commissioner.

Approved: O. L. Spaulding, Assistant Secretary of the Treasury.

A DIVISION OF PROFITS.

The Pittsburg Steamship Co., the lake representative of the United States Steel Corporation, this week sent Capt. W. W. Smith, marine superintendent, and Joseph Hayes, chief engineer, each a check for \$2,141.79 as their portion of the profits of the company, which it is distributing among its employees, in pursuance of its profit sharing plan.

The Pittsburg Steamship Co. has 112 boats, of which 65 are steamers and the remainder barges. Capt. Smith has charge of the operation of these boats and the employment of all the captains. He is the shore captain, or what is known as the ship's husband. Joseph Hayes has charge of all the machinery of the boats and employs the engineers on the sixty-five steamers. Their care, during the time the boats are in operation, is that the craft shall be kept in the very best repair; that they shall be run as economically as possible; and that the best dispatch the boats are capable of shall be obtained from them. In the letter which General Manager Wolvin sent with the checks he said that the company looks upon the positions of the two men as being so closely allied with its interests that a division of the profits with them had been decided upon. The letter said that the energy which the men had put into the work at hand had affected the cost of operating the boats and had helped to bring about the good results. Mr. Wolvin in the letter wished it to be understood that this was the same as taking them in as partners. The letter closed with the following paragraph, which sets out the idea of the company very succinctly:

"It is hoped that the relations between the company and its employees entrusted with considerable responsibility, shall, in the future, partake more of the relations of partnership rather than that of simply employer to employee, and with confidence in the benefits to you of such association we shall heartily co-operate to that end." The sum given to Messrs. Hayes and Smith, amounting to more than \$4,000, increases the total given out by the company to its boat employees to beyond \$25,000 for this season. The first distribution was among the engineers of the sixty-five boats, each receiving from \$100 to \$150 as his share of the profits. This money went to the second engineers as well as the first. Then the captains were remembered, and received sums from \$75 to \$100 each for the entire 112 boats of the fleet.

The idea of distributing part of the earnings was borrowed by the Pittsburg Steamship Co., from the Carnegie Steel Co., which latter organization in reality dominates the lake interest. Mr. Carnegie, acting on the advice of C. M. Schwab, his confidential man and now president of the United States Steel Corporation, distributed each year a certain portion of his profits among his employees. This went to those who were in any way responsible for the cost of producing material or upon whom fell the responsibility for either the quality of the work or the speed with which it was turned out.

BUILDING WARSHIPS.

One of the most readable articles in the February number of the North American Review is from the pen of Mr. W. McAdoo, who was formerly Assistant Secretary of the Navy, and its title is "Launching a Battleship from the Congressional Ways." Mr. McAdoo's object is to show the various stages through which proposals for a new battleship must pass before the actual work can be begun in the construction of the ship itself. The course of the projected vessel is tortuous and full of dangers which threaten her very existence. Once the Secretary and the General Board have agreed on the character of the ship, the various Bureaus set to work elaborating plans. Then the recommendation for her construction is made to Congress by the President and the Secretary of the Navy, and the matter is referred to the Naval Committee. If that body does not negative the project, it is laid before the house for open discussion, and then it is likely to encounter adverse gales in the shape of objections from the Committee on Appropriations and criticisms from representatives whose constituents are not much interested in naval affairs. Having survived that ordeal, it passes on to the Senate, where it has to run the gauntlet of senatorial plans and theories, and only when that has been done, is the appropriation finally passed, the measure going back to the President to receive his signature. Mr. McAdoo intimates that one difficulty in securing appropriations for warships, arises from the great cost of constructing and maintaining them:

"This gives the critics of large expenditures an opportunity for invidious, and sometimes unjust comparison between the aggregates of appropriations for the Army and Navy. A fort having 600 men represents nothing like the expense of a battleship with a smaller number of sailors in her crew. Her first cost is necessarily large, and to keep her in good condition there must be yards at various points, with docks capable of receiving her, surrounded by machine shops and endless supplies to repair her in case of damage. She has to be fitted out with every appliance. She is a city in herself; she distils her own water; she makes her own electricity; she manufactures her own ice; she must have a perfect sewerage and ventilating system; she must have proper kitchens for all divisions of her crew, suitable sleeping and living apartments for her officers and men, a well-conditioned hospital, a library and a church; and last, but not least, she must have a prison and a police force."



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ESTABLISHED 1878.

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CLEVELAND, O., FEBRUARY 6, 1902.

THE SHIP SUBSIDY BILL.

The new ship subsidy bill has been launched favorably. The bill differs in many respects from that introduced into the last Congress and its framers aimed to overcome the objections to the former measure. The first section of the bill takes the postal subsidy law of 1891 as a basis and restores the rates practically to what they were in the bill as it originally passed the Senate. It increases the tonnage required in that law and makes a class of each knot above 14 up to 20; it provides that all American ships engaged in foreign trade shall receive one cent a ton for every 100 miles sailed and that at least one-fourth of the crew of each vessel receiving subsidy must be Americans. No foreign-built ships are admitted to American register; vessels must be built in a manner satisfactory to the Secretary of the Navy, and must be capable of being used for the purposes of national defense in time of war.

"There is," says Senator Frye, in speaking of the bill, "nothing in it that is favorable to any of the trans-Atlantic lines, and there is nothing whatever to encourage the combination in so-called trust form of any large shipping corporations. The shipbuilding industries all along our coasts will get renewed life and stimulation by the increased demands for American vessels." The foregoing are the views of the framer of the bill and certainly seem to be based on a proper understanding of the needs of American shipping and American shippers, the advisability of taking American trade out of the hands of foreigners and carrying American goods in American bottoms not being disputed. The only question in the minds of the opponents of the bill is whether or not this is the best way to secure such a desirable consummation.

Our thanks are due the U. S. Department of Agriculture, Weather Bureau, for a copy of the meteorological chart of the Great Lakes, summary for the season of 1901, by Alfred J. Henry and Norman B. Conger, prepared under direction of Willis L. Moore, Chief U. S. Weather Bureau.

The steamer Montreal, building for the Richelieu Navigation Co., was launched at Toronto, Monday. According to present plans the new Greyhound for the White Star Line, will be launched at Wyandotte one week from next Saturday. The name of the Hart line steamer City of Louisville has been changed to Harriet A. Hart. The steamer is to be given a steam steerer.

THE SHIP SUBSIDY BILL.

It sometimes happens that in response to the question, "What's in a name?" we have to answer, "Just everything." There is now up for discussion in Congress a measure which we do not hesitate to designate as one of the most important ever brought before that body, that is in danger of suffering shipwreck simply and solely because of the unfortunate name which it carries. Unfortunately a large number of the American people have conceived a violent prejudice against the term "subsidy." Apparently they look upon subsidizing as a kind of alms-giving, a sort of feudal scattering of largess, with the difference that the recipients, instead of being supposedly impoverished and helpless, are among the powerful and wealthy of the land. As a matter of fact, shipping subsidies means nothing of the kind. They are based upon the conviction that between the individual shipowner and the nation at large there is, in respect of the up-building and extending of the shipping industry, with all the indirect and enormous national benefits that are to be derived therefrom, a profound community of interest. It is realized that the assistance given by the nation to the shipowner is to be temporary only, and that in its intrinsic value it is altogether disproportionate to the great and lasting national advantages to be derived from the rehabilitation of the merchant marine.

In discussing the subject it is best, at the outset, to distinguish clearly between our "lake and coastwise" and our "deep-sea" shipping. The former is wonderfully prosperous; the latter is not; and the difference is due to that very condition of things which the pending subsidy bill is expected to remedy. Our lake and coastwise shipping is protected against foreign competition by an ironclad law which prohibits foreign ships engaging in the lake and coastwise trade; and the stimulating effect of this law is seen in the fact that this branch of shipping interests of the country is in a flourishing condition, and although it is highly remunerative, there has been a steady reduction of rates. In 1870 it cost as high as \$3.50 to transport a ton of freight from Lake Superior to ports on Lake Erie, while to-day the ruling rate is from 60 cents to \$1 per ton.

Our merchant marine, on the other hand, is in direct competition with that of foreign nations, who are able to build and operate their ships so much more cheaply than ourselves that it is out of the question to compete successfully against them and the object of the ship subsidy bill is to make up, by a certain schedule of payments to the ship-owners, the actual loss to which they would be exposed were they to attempt competition on a large scale with foreign ship-owners. The proposal to extend government aid is qualified by the understanding that such assistance is only to be rendered until we have moved up to our proper position among the maritime nations of the world. Long before our deep-sea shipping has increased to the magnitude of the lake and coastwise shipping, the cheapening of the cost of production which we may reasonably expect to follow the introduction of American labor-saving devices into shipyard work, will place us in a position where we can compete successfully with foreign shipyards. By that time the ship-building industry will be strong enough to hold its own without government assistance. The sum spent in subsidies should be looked upon as a very small price to pay for the multiplied benefits that will accrue from the resumption of our former proud position as the leading maritime nation of the world.

Our present disadvantageous position is shown by the following facts: While the raw materials of ship construction cost but little more in this country than abroad, the cost of labor is so much greater that the final cost per ton of the vessel at the time of launching is 20 per cent more here than abroad. From the report of the Commissioner of Navigation on the subject, we learn that the cheapest cargo steamer ever built in this country, the "Pleiades," of 3,750 tons and 9¾ knots speed, cost \$275,000, while the British cargo steamer "Mascomo," of 4,200 tons and 10 knots speed, cost only \$217,000. The annual charges on the "Pleiades" are \$44,000; on the "Mascomo" \$34,240. The total annual wages for the crew of the "Pleiades" amount to \$14,588; while the total annual wages on the larger ship amount to only \$11,751. As a result of the Commissioner of Navigation's inquiry, it was shown that there is an average difference in favor of Great Britain of 20 per cent. in the cost of constructing

cargo steamers, and of 33½ per cent. in the cost of operation.

Under such conditions profitable competition with Europe is simply out of the question, and American capital has naturally found its way into the protected and highly remunerative coastwise shipbuilding and carrying trade. As the result of our withdrawal from, or rather failure to enter, the competition for the world's carrying trade, we are paying out annually the huge sum of \$200,000,000 to foreign ship-owners for carrying our great and growing volume of exports to foreign countries. In the presence of this startling fact, we are brought face to face with the question as to whether it is consistent with the dignity, and conducive to the best commercial interests of the country, that we should be indebted to foreign nations for the transportation of the products of our fields and factories, and that we should be paying out this great sum of money to foreign firms, when it might just as well form part of the legitimate annual profits of American industry. There are some Americans, it is true, who frankly assert that they are content to let matters remain as they are; but we must not forget that their attitude means the indefinite postponement of any revival of American deep-sea shipping, and that we, who before the days of our civil war were the greatest deep-sea carrying nation in the world, must be content, in spite of our ever-increasing wealth and importance, to continue to hold an inferior position.

The resuscitation of our merchant marine has an important bearing on our position as a naval power. An adequate merchant marine is necessary to any naval country that is to be in a position to transport its troops with speed and safety to a distant center of operations. We all remember the difficulty which we experienced in carrying troops to Cuba, Porto Rico, and the Philippines during the late war; and now that we have extensive foreign possessions, the value of an adequate auxiliary navy has increased enormously. A consideration of the problems of transportation which would suddenly confront us were the Philippines, for instance, made the object of attack by a foreign power, should prove to us the wisdom of subsidizing fast and well-built merchant ships which, in the time of war, could be quickly armed and utilized as consorts to the slower transports, in which troops and munitions of war would be carried.

Lastly, it should be borne in mind that since practically the whole of our foreign trade is carried in foreign bottoms, a war between any of the maritime nations would result in a paralysis of deep-sea commerce and a temporary extinction of our export trade. On the other hand, if we possessed our own merchant fleet we could view such a struggle in its effect upon our carrying trade with comparative equanimity.—Scientific American.

OPENING AND CLOSING OF NAVIGATION, 1901.

Navigation opened at the Straits of Mackinac on April 14 with the passage of the steamer Pentland, at 8:40 a. m., from Lake Michigan into Lake Huron, and was closed for the season with the passage west of the steamer James Watts, coal laden, for Milwaukee, 11 a. m., December 20. The Watts had some difficulty in making passage from Lake Erie to Lake Huron on account of ice.

The canal locks at Sault Ste. Marie opened on April 27 for the passage of the first boat up, the tug Maxwell, and were closed for the season on December 11; the last vessel bound down was the steamer Clyde, with barge Amboy in tow, which locked through at 3:16 p. m.

The last vessel through the Detroit river bound down was the steamer J. H. Schrigley, on December 15, and the last passage up was the steamer James Watts, on December 17, closing general navigation for the season.

The ice blockade in the St. Clair River was one of the features of the opening of navigation. The river was practically closed with ice for 22 days, from April 16 to May 8, during which time navigation was open on the other lakes. Considerable damage was occasioned by collisions in the ice jam, and also from damage to vessels by the ice. At one time there were 20 vessels fast in the blockade between Port Huron and the Flats.

Work on the third steamer to be turned out at the West Superior shipyard is now so well under way that all of her frames are expected to be in position by the close of the present week.

AIDS TO NAVIGATION.

The Cleveland members of the Lake Carriers' committee on aids to navigation, held a conference with Capt. Henry Stone, Frank Rae, George B. Mallory, and Alfred Greenley of the Ship Masters' Association. The members of the last named organization have been discussing the need of new lights and fog signals since the close of navigation last fall. The delegates to the grand lodge meeting, which was held at Washington last week, took the matter up with the officials of the Light-House Board.

At the Cleveland meeting the vesselmen and masters went over a long list of aids to navigation that have been suggested, and they made the following recommendations: Rauleaux ranges at Point Aux Pins; eight gas buoys in the straight channel, at Toledo, four on each side of the channel, gas buoy in the river near Craig's shipyard, and a buoy near Presque Isle; range lights on Point Edward near the mouth of the St. Clair river. The Point Edward ranges were recommended by the masters because several strandings have occurred after the lightship was removed on account of ice, leaving the dangerous channel unmarked.

Gas buoys for the lower end of St. Clair canal cut on the east bank; three gas buoys to mark the American channel at Stag Island, St. Clair river; two gas buoys to mark the St. Clair middle ground; elevation of the beacons and range lights at St. Clair flats from the canal to Huron's island.

For Lake Superior: A fog whistle for Michigan island; a light-house and fog whistle at Rock of Ages near the western end of Isle Royale; a fog whistle at Sand island, and a gas buoy to mark the channel in the "Soo" river near the Dark Hole.

Lake Michigan: Gas buoys for Manhattan shoal near Death's Door, North Graham shoal, Hog island reef; Driscoe shoal, Green Bay; South Fox island shoal, Boulder shoal, south of Gull island, and a gas buoy for Major shoal in the Straits of Mackinaw; gas buoy for Garden island shoal; permanent light-house and fog whistle to be placed on Racine reef; light and fog signal on outer water-works crib off Chicago harbor.

For Lake Erie the committee recommended a light and fog signal at Point Abino, and gas buoys for Seneca and Waverly shoals near Buffalo.

All the new light and fog signals that were recommended are badly needed, and Capt. George P. McKay, chairman of the committee on aids to navigation, of the Lake Carriers' Association, and the members of the legislative committee will take the matter up with the officials at Washington at an early date.

LIGHT-HOUSE BOARD OF THE UNITED STATES.

(Organized in Conformity to the Act of Congress Approved August 31, 1852.)

LIST OF MEMBERS ON JUNE 30, 1901.

Hon. Lyman J. Gage, Secretary of the Treasury, ex-officio President.
Rear Admiral Norman H. Farquhar, United States Navy, Chairman.
Col. Walter S. Franklin.
Col. Alexander McKenzie, Corps of Engineers, United States Army.
Brig. Gen. George L. Gillespie, Chief of Engineers, United States Army.
Dr. Henry S. Pritchett, Institute of Technology.
Capt. Benjamin P. Lamberton, United States Navy.
Capt. Washburn Maynard, United States Navy, Naval Secretary.
Maj. Daniel W. Lockwood, Corps of Engineers, United States Army, Engineer Secretary.

EXECUTIVE MEMBERS OF THE BOARD.

Rear-Admiral Norman H. Farquhar, United States Navy.
Capt. Washburn Maynard, United States Navy.
Maj. Daniel W. Lockwood, United States Army.

OFFICERS IN CHARGE OF LIGHT-HOUSE DISTRICTS ON JUNE 30, 1901.

Ninth District.—Inspector, Commander F. M. Symonds, United States Navy, Chicago, Ill.
Engineer, Maj. James G. Warren, Corps of Engineers, United States Army, Milwaukee, Wis.
Tenth District.—Inspector, Commander A. Dunlap, United States Navy, Buffalo, N. Y.
Engineer, Maj. T. W. Symonds, Corps of Engineers, United States Army, Buffalo, N. Y.
Eleventh District.—Inspector, Commander J. C. Wilson, United States Navy, Detroit, Mich.
Engineer, Lieut. Col. Thomas H. Handbury, Corps of Engineers, United States Army, Detroit, Mich.
Fourteenth District.—Inspector, Commander William H. Turner, United States Navy, Cincinnati, Ohio.
Engineer, Maj. William H. Bixby, Corps of Engineers, United States Army, Cincinnati, Ohio.

MARINE PATENTS.

692,278.—Life-preserver. George Hamberger and Gustav A. Stelzer, Berne, Switzerland.
692,355.—Apparatus for loading or unloading bulk cargoes. Alexander W. Robertson, London, England.
694,400.—Means for disengaging and replacing the supports of boats on ships, etc. Thomas Wilson, Sunderland, England.
692,417.—Dredge or grapple. Alex. Bechers, Hoboken, N. J.

BUFFALO.

Special Correspondence to The Marine Record.

The coal men are taking things easy and they will not do anything until season ore rates have been fixed. According to reports from the head of Lake Superior, coal is moving off the docks briskly and the docks at all the upper lake ports will be in good shape at the opening of navigation. That means that there will be a good demand for coal carriers from the start and that the movement for the season will be heavy. The Pittsburg Coal Co., it is understood, will send considerable coal forward from Toledo the coming season.

An adjustment of the differences between the local tug firemen and the Great Lakes Towing Co. was reached early Saturday morning, and the firemen required on the two tugs now in commission reported for duty. No further trouble or delay in the shifting of vessels about the harbor is likely to occur. Settlement was made on the basis of \$50 a month, the regular summer rate, and two firemen will be employed on each boat, when the amount of work to be done warrants their services. The demand of the men was for \$1.75 a day and two men to each boat whenever a tow was made. They get \$1.66 and two men in the discretion of Captain Vroman, the local manager.

Capt. Wolvin, of Duluth, who has decided to make Quebec the center of his Canadian transportation operations, has returned home. Mr. G. Smith, who is named assistant general manager, remained in Quebec to organize that end of the business. In the meantime, the transportation company is negotiating with the Great Northern railway for the use of their elevator, and, if arrangements can be made with the latter, the transportation company will make use of it until its own is constructed, and, if satisfactory arrangements cannot be made, it will bring on a floating elevator. The transportation company has arranged to place 20 lake vessels in the service immediately on the opening of navigation, and these vessels will enter the Inner Louis Basin, to discharge cargo into the elevator. The company has one year to complete all arrangements, including the construction of the elevator, and its shipments will be made between Montreal, Liverpool, Manchester and London.

Efforts of the three great passenger associations, Trunk, Central and Western, to induce the lake lines to discontinue the commission system of stimulating summer business and to agree on tourist rates for the coming season have failed. Representatives from the passenger associations held a conference with representatives from the lake lines a few days ago, and although over twenty prominent lake transportation men were present, they decided not to commit themselves to any agreement, the reason given by them being that there were six other lines, not represented, and an agreement without their presence might result in friction. The cause of the railroads was presented by F. C. McDonald, of the Central Passenger Association; Eben E. McLeod, of the Western Passenger Association and C. L. Hunter, representing Commissioner Hunter of the Trunk lines. Among the representatives of the lake lines were Joseph Berolzheimer, of the Manitou line; C. C. Church of the Northern Michigan; C. F. Spencer, of the Lake Michigan and Lake Superior Transportation Co.; E. C. Davis, of the Goodrich line; J. W. Brown, of the Georgian Bay Transportation Co.; W. F. Herman, of the C. & B. line; A. A. Schantz, representing the Detroit & Cleveland Transportation Co. and several others. While the representatives of the lake lines present would not commit themselves to whether or not they would like to come to an agreement with the railroads, as it was intimated that if all of the lines had sent representatives, some adjustment would have been agreed to. "As some of the lake lines were not represented, we did not feel it our privilege to agree to any plan without their consent," said one of the lake men. The question of the new Detroit & Buffalo steamer line rates was stated that a rate of \$3.50 from Buffalo to Detroit had been decided upon. This was considered too low by the railroads, and was one of the rocks on which the conference split. It is understood that the railroads will decline to issue interchange tickets, unless the rate of the new line is made the same as that of the Northern Steamship line. There is an effort being made to establish a system of summer excursion rates by which a railroad ticket will be accepted for transportation by the lake lines and vice versa, as was the case during the recent Exposition. It is claimed the low rate contemplated by the Detroit & Buffalo line is a bar to such arrangement, at least so far as that line is concerned.

DULUTH-SUPERIOR.

Special Correspondence to The Marine Record:

M. J. Hecking, draftsman at the Superior Ship Building Co.'s yards, will leave about February 1, for Richmond, Va., where he has accepted a position in the engineering and drafting department of the W. R. Trigg Ship Building Co. Mr. Hecking has been engineering and hull draftsman at the local shipyards for about four years, and leaves now because he is offered a larger field and more lucrative position. The name of his successor is not yet made public.

Wm. Lowrie, general passenger agent has announced that the management has decided that the steamers North West and North Land will be operated between Chicago

and Buffalo during the season of 1902, and on the experience of last year it is their purpose to continue these boats in this service permanently. The Northern Steamship Co. is spending between \$350,000 and \$400,000 in improvements on those two steamers and is substituting Scotch boilers for the Belleville boilers, which will develop a material increase of speed, power and safety. The ports of call will be Milwaukee, Harbor Springs, Mackinac, Detroit and Cleveland.

The Minneapolis Journal says that a merger embracing practically the whole coal trade of the Northwest, both anthracite and bituminous has been brought so near accomplishment that there is no question of its success. It is part of the plan followed to consolidate an agency here and one in St. Paul. This will put all the retail dealers now purchasing supplies from large companies out of business. President C. E. Wales of the Pioneer Fuel Co. will be the general Northwestern manager of the consolidation. The plan followed has been to join the anthracite and bituminous branches of the trade separately. This having been accomplished, the two are now brought together. The combination naturally originates with the large companies owning coal docks at Superior and Duluth. It is believed that the combination of coal interests is general and that in other large districts it will be handled from convenient centers as will be done in the Northwest. Minneapolis is to be the head office in this section.

The first of the new Tomlinson boats, a steamer, to be launched at the shipyard of the Superior Ship Building Co., at West Superior, will be the Sultana. She will be christened by Dorothy Moore, the daughter of Alderman and Mrs. W. S. Moore. The date of the launching has not been announced, but it will take place within a few days. It will be the second winter launching at the West Superior shipyard this year, is of steel and is designed especially for the grain trade between Duluth and Buffalo. She will be ready to go into service at the opening of navigation, and will represent an outlay of \$230,000. The Sultana will carry 5,000 gross tons on 18 feet draft, the usual summer draft on the connecting waters of Lake Superior and Huron. She will be equipped with two Scotch boilers 14x12 feet in size, and a triple-expansion engine, 20x33½-55 inches, with 40-inch stroke. The Sultana will have accommodations for eleven passengers, and these apartments will be superbly finished and furnished. The ship will be lighted by electricity and provided with all approved modern improvements and facilities. The house flag of the Sultana will be the color of the University of Michigan, yellow and blue. It is expected that she will have a speed of twelve miles an hour loaded, her general hull dimensions are, length, 366; beam, 48 feet; depth, 28 feet.

The Eastern Minnesota road has invited bids from contractors for the construction of a 600-foot addition to its new ore dock on Allouez bay. The new addition will make the structure the biggest iron ore dock in the world. It will have a total storage capacity of 100,000 tons, thus making it bigger than either of the two largest docks of the Missabe road in Duluth, which are at present the largest ore docks in the world. The 600-foot addition will provide for 100 pockets and a storage capacity of about 40,000 tons. This dock is the highest in the world, being 72 feet from the water to the top. Barnett & Record were the contractors for building the dock two years ago, but the contract for the addition has not been awarded as yet. The new addition to the dock will have fifty pockets on either side. The great height of the structure is provided on account of the very large class of boats, becoming more numerous each year, which require greater dock elevation for the convenient movement of ore from the dock to the hold. The Eastern Minnesota has come rapidly to the front as an ore handling road. It expects to handle 3,000,000 tons this year, which will be an increase of about 700,000 tons over 1901. The company is constantly adding to its list of shipping mines, and is every year enlarging its volume of ore traffic. The addition of 100 new pockets to the big dock will give it important increased facilities for receiving and shipping ore. It is expected that the new addition will be ready for shipping during a part of the approaching season of navigation.

LAUNCH OF THE E. M. SAUNDERS.

The new Gilchrist steamer E. M. Saunders was successfully launched on Thursday, from the yards of the American Ship Building Co., at Lorain. As the steamer glided down the ways Miss Caroline, the daughter of E. M. Saunders, for whom the vessel is named, broke a bottle of wine over the prow, christening the boat. The launching party, which arrived on a special Lorain & Cleveland motor, was made up as follows: A. J. Gilchrist, C. P. Gilchrist, F. W. Gilchrist, Capt. Lewis Weeks, J. D. Mitchell, Capt. J. D. Todd, Capt. William Kennedy, Capt. Ben Mosher, F. C. La Marche, J. C. Wetmore, secretary of the shipbuilding company, all of Cleveland; C. A. Kennedy, of Oshkosh, Wis.; Mr. and Mrs. E. M. Saunders and daughter, of St. Paul, and Mr. Arnold Saunders and family, of Cleveland. The Saunders is a sister ship of the F. W. Hart and F. M. Osborne, recently launched here for the same company, and is 400 feet long, 50 feet beam, and 28 feet depth of hold. The fourth steamer for the same company is now on the stocks and will be ready for launching in a few weeks. The fifth steamer will occupy the berth just vacated by the Saunders.



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THE COST OF AN ISTHMIAN CANAL.

It is not probable that the requirements of our Pacific coast commerce and industries may demand an isthmiian canal either with tolls just sufficient to pay costs of operation and maintenance, or possibly, without tolls. The expenses to be incurred annually, therefore, in the operation and maintenance of the canal after completion constitute an item of gravity. The Commission made a most careful study of this feature. Its estimates for the Nicaragua route were \$3,350,000 and \$2,000,000 for the Panama route, exhibiting a less annual cost of operation and maintenance in favor of the Panama route, exhibiting a less annual cost of \$1,350,000, which should not be lost sight of in the comparison of the two crossings.

The commission sums up the cost of building the canal on the Nicaragua route and of completing the Panama Canal, excluding the costs of acquiring both the concessions from the different governments and the rights and property of the new Panama Canal Co., as follows: Nicaragua, \$189,864,062; Panama, \$144,233,358.

The new Panama Canal Co. has estimated the value of its rights and property at \$109,141,500, but the commission estimates the value of the same rights and property at \$40,000,000. If the former sum be included, the total cost of completion of the Panama Canal and the acquisition of the rights and property of the new Panama Canal Co. would be \$253,374,858. This is the amount which must now be compared with the preceding estimated cost of the Nicaragua Canal.

In order to determine the total estimated cost of the Isthmian canal by either route, there must be added to the preceding figures the costs of securing the requisite concessions from the Colombian government in the one case, and from the governments of Costa Rica and Nicaragua in the other, as there are at present neither concessions from nor treaties with any of those countries of sufficient scope or in terms sufficient or adequate for the completion of the canal.

The Panama route is but 49.09 miles long from ocean to ocean, which is but little more than one-fourth of the total length of the Nicaragua route. There is, therefore, less room for variety of features than is found on the Nicaragua line. The city of Colon, formerly called Aspinwall, was chosen by the old Panama Co. as the Atlantic terminus. The route then follows along the marshes in a southwesterly direction to a little place called Gatun, on the Chagres river. From that point it follows the line of the river in a general way to Obispo, thirty miles from Colon. At Obispo the route leaves the Chagres and enters the Emperador cut, which merges into the great Culebra cut, where the line crosses the continental divide. From the latter point its general course lies along a small stream called the Rio Grande until it reaches the waters of Panama Bay.

This route has attained great prominence within the past twenty years in consequence of the work done on it by the old Panama Canal Co. a French corporation of which Ferdinand de Lesseps was the head. It was not until 1883 that work upon a large scale was begun. The plan adopted was that of a sea-level canal and included a bottom width of 72 feet and a navigable depth of 29.5 feet. The entire cost of the work was estimated by Lesseps in 1880 at about \$128,000,000, and eight years for the time required.

Work under this sea-level plan was prosecuted actively until near the end of 1887, when it became evident that a canal on a sea level-plan could not be constructed for the amount of money and time then available to the company.

The federal statute under which the Isthmian Canal Commission was created required that body to make examinations and devise plans for a canal of sufficient navigable depth and of the requisite dimensions to accommodate the largest vessels afloat. As a rule, merchant ships are longer than naval vessels, while the latter class have relatively much the greater beam or width. The longest vessel now afloat is the Oceanic, of the White Star Line; it has a length of practically 704 feet. It is quite probable

that within a comparatively short time longer vessels will be built, but it would manifestly be impracticable for the commission to take into consideration the possible development of ship design for an indefinite future period. It was, then, necessary to consider those vessels at present afloat whose dimensions are the largest yet used, and design the canal and its works so as to afford a reasonable margin beyond those limits, but not so great as to involve excessive cost. To meet these conditions the locks were designed to give a clear length of 740 feet and a clear width of eighty four feet. The greatest beam or breadth of warship at present is practically seventy-seven feet. The locks, therefore, meet the requirements of the law and give some room for developments beyond the maximum limits of size already attained.

It is well known that ships drawing as much as thirty-two feet in sea-water have entered or passed from New York harbor as well as some other ports, and there is no reason to believe that the limit of draughts has yet been reached. It was, therefore, decided that the least navigable depth in the canal should be thirty-five feet, and that limit has been carefully observed throughout its entire length. In the harbor entrances at the extremities of the canal this depth of thirty-five feet is provided at mean low tide.—From "The Proposed Isthmian Canal," by William H. Burr, in the February Scribner's.

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, reports the condition of the Eastern freight market as follows:

The volume of business for this week has been on a limited scale and the only direction in which there is any improvement in rates is for case oil to the far East, in which direction quite a little business has been transacted, as shown below. It is quite possible that further tonnage could be placed on a similar basis.

Notwithstanding the lower price of grain, shippers are still unable to execute fresh orders, consequently there is practically no demand for full cargoes.

The few fixtures reported in this issue from the Atlantic cotton ports show the limited requirements from that direction, and there is no anxiety on the part of charterers to make commitments ahead.

From the Gulf timber ports there is a moderate enquiry but the tendency is toward lower rates. Time charters are neglected for the time being.

Activity in sail tonnage for long voyage continues hampered by the low rates current for steamers, while in all other branches the market shows no animation and rates remain nominal.

STATEMENT OF THE VISIBLE SUPPLY OF GRAIN.

As compiled by George F. Stone, Secretary Chicago Board of Trade February 1st.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo.....	4,428,000	551,000	527,000	29,000	966,000
" afloat.....	430,000	84,000			
Chicago.....	6,830,000	4,615,000	531,000	1,060,000	189,000
" afloat.....	417,000			77,000	
Detroit.....	434,000	203,000	40,000	130,000	21,000
Duluth.....	10,407,000	221,000	180,000	454,000	275,000
" afloat.....	511,000				
Fort William, Ont..	4,284,000				
Milwaukee.....	583,000	109,000	401,000	42,000	194,000
Port Arthur, Ont..	100,000				
Toledo.....	101,000	1,058,000	548,000	240,000	
Toronto.....	75,000		13,000		46,000
On Canals.....	46,000	3,000	112,000	37,000	50,000
Grand Total.....	57,929,000	11,632,000	4,531,000	2,403,000	2,120,000
Corresponding Date, 1900.....	59,767,000	14,825,000	9,929,000	1,195,000	1,873,000
Increase for week.....			398,000		47,000
Decrease ".....	1,444,000	120,000		38,000	

While the stock of grain at lake ports only is here given, the total shows the figure for the entire country except the Pacific Slope.

ATMOSPHERIC PRECIPITATION AND LAKE LEVELS.

ALFRED J. HENRY, PROFESSOR WEATHER BUREAU.

The precipitation during the season of November, 1900, to October, 1901, was below the average over the greater part of the basins of Lake Michigan, Lake Erie, and over the southern part of the basin of Lake Huron. It was likewise deficient over the western part of Lake Superior. More than the average precipitation was recorded over the central and eastern part of Lake Superior, the northern portion of Lake Huron, especially the Georgian Bay region, and over the entire basin of Lake Ontario. The snowfall of the winter of 1900-1901 was somewhat greater than during the previous winters in all of the lake basins, except those of Lakes Ontario and St. Clair.

The fall rains of 1900 were unusually heavy throughout the entire Lake region. The winter precipitation was somewhat less than during the preceding year, while that of the spring and summer did not differ materially from that of the preceding season. The rainfall of the fall months was much less than that of the preceding year for the corresponding period.

At the close of navigation in 1900 the level of Lake Superior was considerably higher than it had been for a number of years previous. The high water continued throughout the winter of 1900-1901, and well into the summer, reaching its highest point in August. The level then began to decline, the mean stage in November being 602.44 feet above mean tide at New York, or half a foot lower than it was during November, 1900.

Lakes Huron and Michigan were also higher than during the preceding year up to and including the month of September. During October the mean stage fell about one-tenth of an inch below what it was in 1900, and continued to fall in November. At the close of navigation Lake Michigan was at a mean stage of 579.93 feet above mean tide in New York City, or about three-tenths of a foot lower than it was in the corresponding month a year ago. Lake Erie was, as a rule, lower this season than during 1900. The mean stage during November was 571.25 feet above mean tide at New York, the lowest point reached in the last four years.

WRECKS AND CASUALTIES DURING 1901.

The season of navigation of 1901 will pass into history with a record of 37 total losses from weather conditions and 10 from other causes. In addition to the total losses, 140 vessels were more or less damaged by the weather conditions, of which number 34 cases were due directly to fog.

The total amount of estimated damages from weather conditions or fog was, \$1,149,300, of which amount \$688,700 was in total losses and \$460,600 in partial losses; fog was responsible for damages amounting to \$239,950, which includes two total losses. The total amount of estimated losses this season nearly equals the combined losses of 1899 and 1900.

In past years Lake Erie has usually headed the list with the largest amount of losses; this season Lake Superior is first, with \$524,450; Lake Huron, \$305,850; Lake Michigan, \$199,000; Lake Erie, \$39,000; Lake Ontario, \$16,500. Connecting rivers, \$64,500.

The total number of lives lost, due to stormy weather, was 90; other causes, 100; by lakes the record is as follows: Lake Superior, weather, 37, other causes, 23; Lake Michigan, weather, 12, other causes, 18; Lake Huron, weather, 26, other causes, 7; Lake Erie, weather, 5, other causes, 16; Lake Ontario, weather, 7, other causes, none. Connecting rivers, weather, 3, other causes, 36; the large number of lives reported lost from other causes on the rivers including loss of life from capsizing of sail boats, falling off docks, vessels, etc.

The loss of life this season, due to foundering of vessels, was large, the two largest cases being the Hudson with 24 lives, and the Baltimore with 12.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—NEW YORK.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., January 30, 1902.

Sackett's Harbor Light-Station.—Notice is hereby given that on the opening of navigation, 1902, the color of the red-brick tower and keeper's dwelling at this station will be changed to white.

The station is located on Horse Island, southerly side of the entrance to Black River Bay, and about 1-3 miles westerly of the entrance to Sackett's Harbor, easterly end of Lake Ontario.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS.—MICHIGAN.

DETROIT RIVER.

Grosse Isle South Channel Range Light-Station.—Notice is hereby given that on the opening of navigation, 1902, the color of the two lights at this station, will be changed from white to red without other change.

The station is located near the northerly end of Grosse Isle, westerly side of the main channel of Detroit river.

Grassy Island North Channel Range Light-Station.—Notice is hereby given that on the opening of navigation, 1902, the color of the keeper's dwelling and the towers at this station will be changed from yellowish drab to light straw-color with white trimmings.

This station is located to the northward and westward of Grassy Island, westerly side of the main channel of Detroit river.

LAKE ERIE.

Horseshoe Reef Light-Station.—Notice is hereby given that on the opening of navigation, 1902, the characteristic of the fourth-order light at this station will be changed by reducing the interval between flashes from 90 to 30 seconds so that it will thereafter be fixed white varied by a white flash every thirty seconds.

The station is located on Horseshoe Reef, New York, northeasterly end of Lake Erie, near the head of Niagara river, and on the northerly side of the approach to Buffalo harbor.

Sandusky Bay Outer Range Light-Station.—Notice is hereby given that on the opening of navigation, 1902, the following changes in the lights at this station will be made:

Front Light.—The illuminated arc of this fixed white fifth-order light will be changed from 180 degrees to 315 degrees, the dark section will then lie in rear (southwesterly) of the light, between N. 34 degrees, 30 minutes E. (N.E. 5-16 N.) and N. 79 degrees 30 minutes E. (E. 15-16 N.), and will be bisected by the range line.

Rear Light.—The illuminated arc of this fixed white fifth-order light will be changed from 315 degrees to 180 degrees, and the light will then illuminate the horizon to the eastward between S. 33 degrees E. (S.S.E. 15-16 E.) and N. 33 degrees W. (N.N.W. 15-16 W.), or 90 degrees on either side of the range line.

These lights are located in the easterly part of Sandusky Bay, on the westerly prolongation of the axis of the improved channel from Lake Erie into Sandusky Bay, Ohio.

Sandusky Bay Inner Range Front Light-Station.—1902, the arc of illumination of this fixed red sixth-order light will be reduced from 180 degrees to 90 degrees and the light will then illuminate the horizon to the southward between N. 27 degrees 56 minutes W. (N.N.W. 1/2 W.) and N. 62 degrees 04 minutes E. (N.E. by E. 1/2 E.), or 45 degrees on either side of the range line.

The station is located on the northerly prolongation of the axis of the Straight Channel in Sandusky Bay, Ohio, southerly side of the westerly part of Lake Erie.

Bearings are true.

By Order of the Light-House Board.

N. H. FARQUHAR,
Rear-Admiral, U. S. Navy, Chairman.

A PERFECT WINDLASS.

The windlass for the yacht which is now being built for Emperor William of Germany will be furnished by the American Ship Windlass Company, of Providence R. I. The ship windlass company has built about seven-eighths of all the yacht windlasses that have been made in this country. The company has made several windlasses of a special nature for yachts, of which the one at present under construction is but one design, another being the windlass which was placed on the cup defender, Independence. In that case the windlass was also a vertical windlass, and made of highly polished bronze.

The order for the windlass for the Emperor's yacht was received by President Frank S. Manton of the American Ship Windlass Co., from Townsend & Downey, builders of the yacht, and the plans which were drawn up under the direction of head draughtsman Henry D. Van Doorn of the windlass company, are described as follows:

"The windlass is what is commonly called a vertical windlass, consisting of a bronze band keyed to the shaft under which is the wildcat, or chain wheel, operated by inserting a block key in a pocket in the lower edge of the barrel and a corresponding pocket in the upper rim of that wildcat, thus locking the wildcat to the barrel.

"The wildcat is to be made of the best gun iron. On the outside of the lower rim of the wildcat, there is provided a wrought iron friction band brake which is operated by a lever placed in a socket, being in the shape of a cam, and as the man bears down on the lever, the cam pressing against the friction band casting, the tension is applied to the band brake. The brake is provided with two levers and two cams, so that it can be applied when the windlass is working in either direction, or in other words, so that both chains can be taken on the same wildcat. Below the friction band on the outside of the lower rim of the wildcat, there are provided bosses for holding pawls for taking the backward strain which the chain brings on the windlass, and this relieves the strain on the men. On the inside of the lower rim of the wildcat there is an internal gear which is driven from the shaft by means of a centre gear, which is keyed to the shaft, driving three idler pinion gears, these three pinion gears meshing in the internal gear of the wildcat. The pinion gears are carried by one gear plate common to all these gears. The pinion gears are of cast steel and the gear plate is of the best quality of gun iron.

"The whole windlass is mounted on a vertical shaft which passes through a bronze base casting, which is bolted to the deck, the shaft passing down through the deck to a step bearing on the deck or the hull below. The end of the shaft runs on a steel thrust washer, and in a bronze bushing in this step. The capstan barrel is surmounted by a brass cover which is engraved with the name of the yacht and the builders.

"The head of the windlass is provided with bar holds for taking the bars for operating the same. The head is also provided with a patent ring bar hold stopper, which consists of a bronze ring with openings to correspond with the bar holds in the head of the barrel. By turning this ring all the bar holds can be covered or uncovered simultaneously."

The diameter of the barrel at the smallest part will be 10 1/4 inches. The height above the deck will be about 34 inches, the diameter of the base will be 31 inches, and the windlass is to be fitted to a 1-16 standard stud link chain. All of the bronze parts of the windlass will be finished and highly polished. All of the wrought-iron

WINTER MOORINGS.

A 32-page booklet showing where about 2,000 vessels are laid up for the winter. It gives steamers, schooners and barges and a list of tugs as well as a list of the vessels which were lost last season and is quite reliable, being taken from correspondence at the various lake ports. Copies sent by mail prepaid on receipt of 25c. The MARINE RECORD Publishing Co., Western Reserve Bldg., Cleveland, Ohio.

parts and also the gun-iron wildcat will be nicely galvanized. More than ordinary pains have been taken on this windlass to make it as nearly perfect as possible, and it will be considered the finest machine known to the art.

As the yacht is to be launched during the latter part of next month the windlass is to be made and delivered at the shipyard, Shooters' Island, before that time.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Action for Reformation of Insurance Policy.—Where the complaint in an action on a marine policy alleges that the destination of a vessel was inserted by mistake, and asks that the policy be reformed, and for a recovery on the contract as reformed, an equitable issue is raised by denial interposed thereto, and the action is triable at equity term of the Supreme Court, instead of by a jury. Imperial Shale Brick Co. vs. Jewett et al., 62 N. E. Rep. (N. Y.) 167.

Marine Insurance.—Where an insurance policy is susceptible of two constructions, that most favorable to insured should be adopted. Imperial Shale Brick Co. vs. Jewett et al., 62 N. E. Rep. (N. Y.) 167.

Admiralty.—Claim For Salvage.—Interest.—Where a libellant made greatly exaggerated claims for salvage services and towage, he will not be allowed interest on the amount recovered. Merritt & Chapman Derrick & Wrecking Co. vs. Chubb et al., 111 Fed. Rep. (U. S.) 1003.

Lloyd's Policy.—Where a certificate of insurance is issued by the agents of underwriters subject to the condition of a certain open policy, the contents of which are unknown to the insured, the underwriters were liable as joint insurers, though the certificate stated that such open policy was issued by the association, and the policy in fact made the members of the association liable in their individual capacity only, and under its terms each underwriter assumed only his proportionate part of the aggregate amount payable in the event of loss. Imperial Shale Brick Co. vs. Jewett et al., 62 N. E. Rep. (N. Y.) 167.

In referring to the marine type of water-tube boiler, Engineering says it is under consideration whether it would not be advisable to adopt a combination of the cylindrical boiler and water tube, using cylindrical boilers for three-fifths of the generating plant, the remaining two-fifths being of the water tube type, in a British 15,000 indicated horse-power battleship, which will be engined by Messrs. Harland & Wolff, of Belfast. If this arrangement were adopted, the cylindrical boilers would be used for cruising and low power generally, working at a low pressure, and the water-tube boilers would be brought into service when a sudden increase in power was called for.



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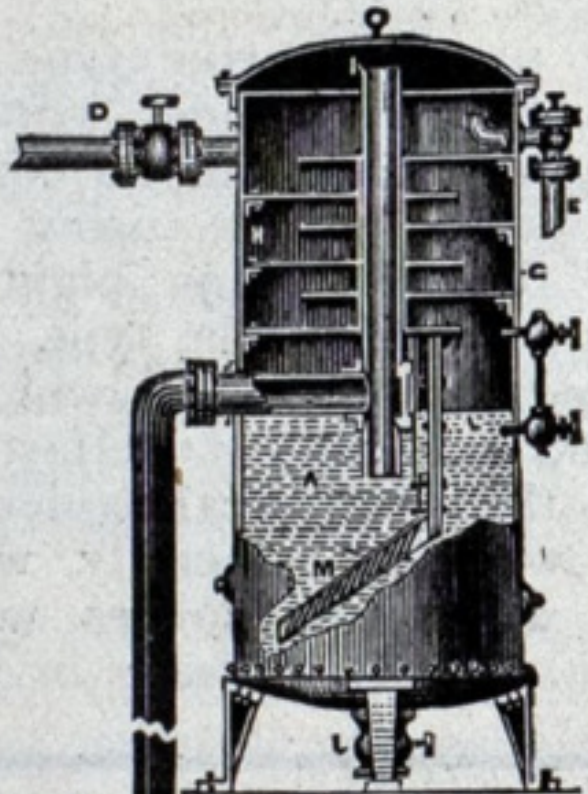
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portation Co.'s steamer Manitou.

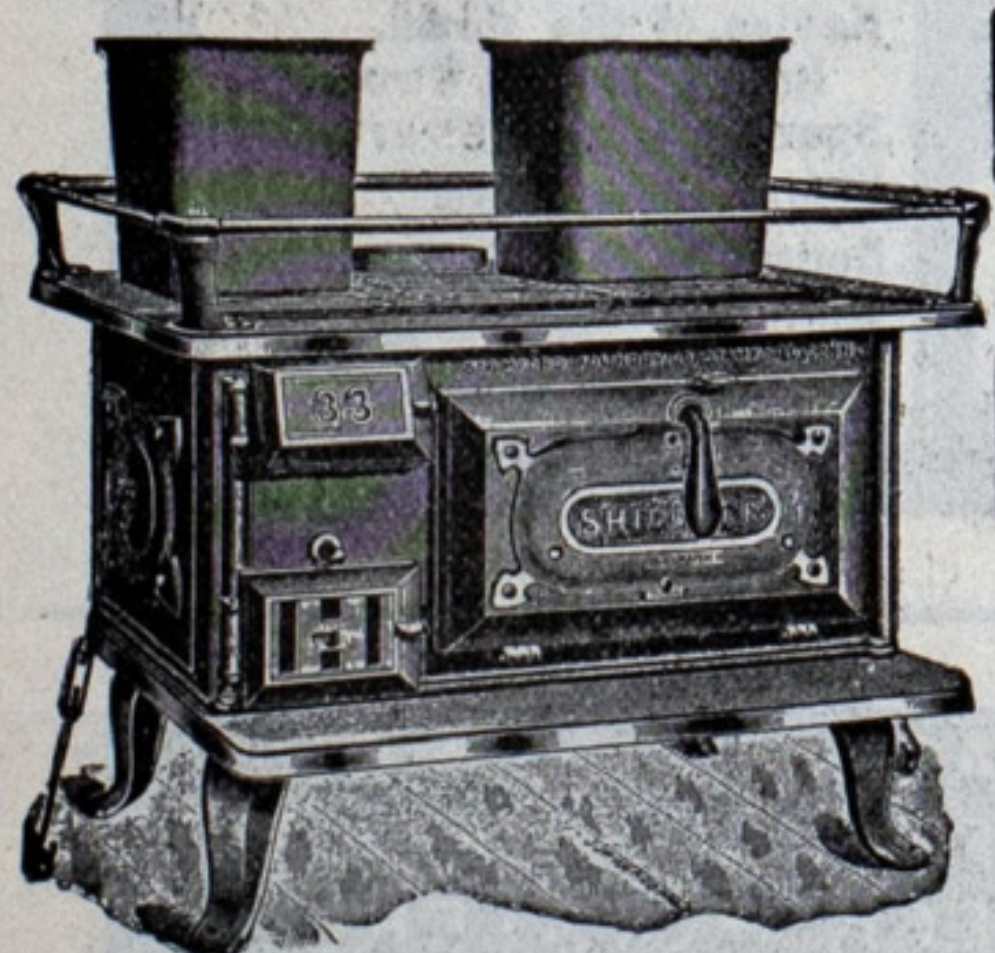
Bessemer Steamship Co.'s steamers S. F.
B. Morse and Douglas Houghton.

American Transportation Co.'s steamers
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Red Star Line's steamers Robert Mills and
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Wilson Transit Line's steamers W. D. Rees
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as are on the two-oven Shipmates.

Some people say it is bad for
trade to make things so durable;
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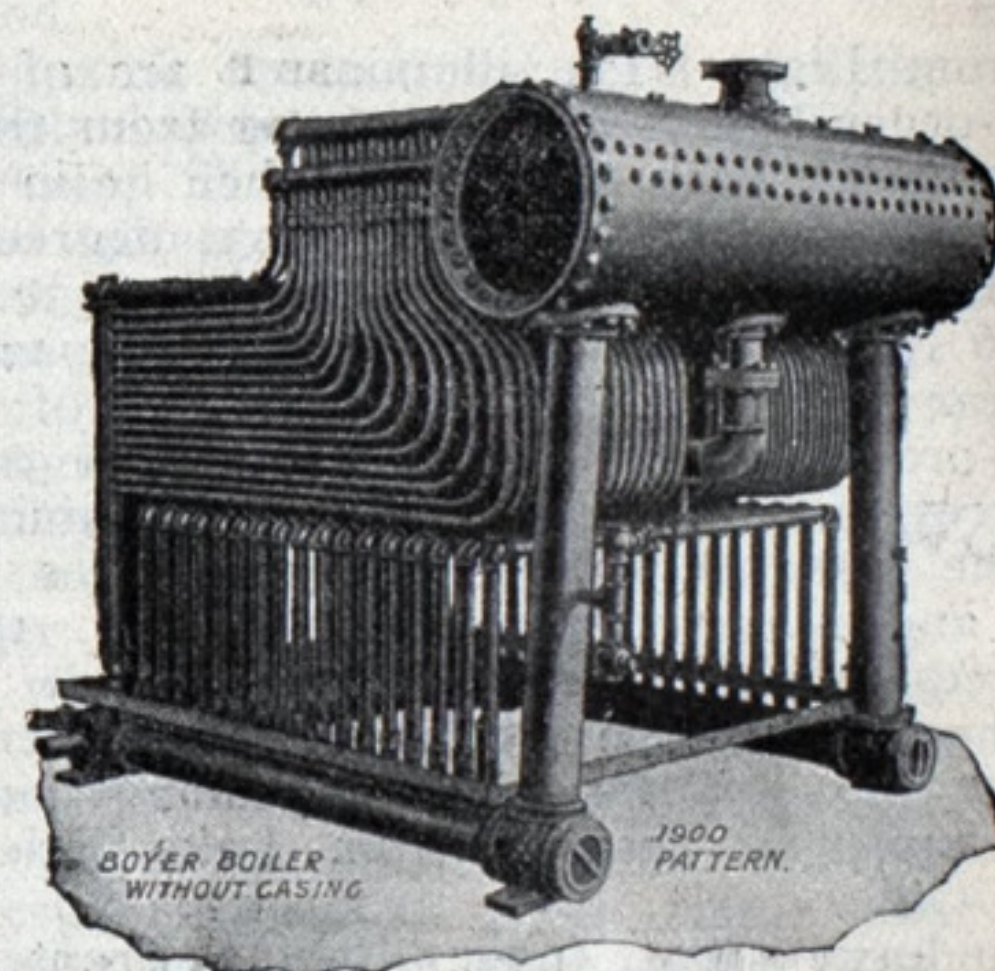


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The following single screw wooden
hull passenger steamer, all in good condi-
tion, on easy terms, and at low figures.

Steamer Hunter, length, 133.6; beam,
19.6; net tons, 181; draft, 9 ft.

Steamer Liberty, length, 96.8; beam,
18.3; net tons, 126; draft, 8½ ft.

Steamer Barker, length, 96.2; beam, 17;
net tons, 131; draft, 8 ft.

We have recently sold one of our small
steamers, and any one desiring one or
more of above boats will do well to corres-
pond immediately. They will be sold at a
bargain, owing to our replacing them with
steel vessels of larger capacity. A.
BOOTH, & COMPANY, Chicago. 6-t. f.

OHIO RIVER-LAKE ERIE CANAL.

The House Committee on Railroads and Canals has referred to a sub-committee, of which Representative Davidson, of Wisconsin, is chairman, the bill of Representative Dalzell, of Pennsylvania, incorporating the Lake Erie and Ohio River Ship Canal Co. A similar measure was reported favorably last season, but failed to pass the House. The bill authorizes the company to issue capital stock not to exceed \$300,000 a mile, with a bonded indebtedness not to exceed the same sum. As soon as \$5,000 of stock per mile is subscribed and paid for, a meeting of the shareholders is to be called to be held in Pittsburg to elect directors. The main office is to be in Pittsburg and the company is to be subject to the control of the interstate commerce commission.

The company is empowered to construct and maintain a canal from some point near Pittsburg and near the junction of the Monongahela and Allegheny rivers, thence via the Ohio, Beaver and Mahoning rivers in Pennsylvania and the Mahoning river in Ohio, to a point at or near Niles, O.; thence northerly through Ohio to the most accessible harbor on Lake Erie, between Pennsylvania and the Ohio state line and the mouth of the Grand river in Ohio. It is also authorized to construct and operate a branch canal from the mouth of the Shenango river to a point at or near Greenville, Pa.; also a branch canal from a point at or near Niles, O., thence along the Mahoning river to a point at or near Warren, O. The main canal is to be at least fifteen feet in depth.

The company is authorized to acquire land necessary for the canal, and to take the necessary water from the Beaver, Mahoning, French creek, Grand, Sandy creek, and Little Shenango rivers, but without diminishing the water supply at any city or village below reasonable requirements, or to pollute the same.

The plans are to be approved by the Secretary of War. Among the other provisions of the bill is that the government may take possession of the canal at any time on 30 days' notice after appraisalment of arbitrators.

All of the soft coal at the head of Lake Superior will be cleaned off the docks before the winter is over.

FLOTSAM, JETSAM AND LAGAN.

Henry E. Smith, of Owen Sound, secretary of the Northern Navigation Co., died at St. Michael's hospital at Toronto Wednesday morning of Bright's disease. Mr. Smith was forty-three years old and one of the best known men in the upper lakes trade.

The Canadian canal at Sault Ste. Marie was open for navigation for 246 days last season, as compared with 238 days in the season of 1900. The number of vessels which passed through the canal in the period from April to December, was 4,204, an increase of 1,123 over the previous season. The vessel tonnage amounted to 2,449,748 tons, or 225,000 tons more than 1900. The freight tonnage aggregated 2,820,394 tons, being an increase of 784,717 tons.

The steamer E. C. Pope was floated out of the stationary drydock at Milwaukee Wednesday with the damage sustained through running upon St. Helena shoal in the Straits of Mackinac fully repaired. Eighteen plates had to be removed either for renewal or rerolling, and a number of frames required re-inforcement. Her repair bill will amount to between \$4,000 and \$5,000. Capt. W. A. Williams, recently in the steamer Spokane, will succeed Capt. L. A. Wilkin in command of the Pope.

A New York advertiser says: "A man may or may not read a poster in a way to receive a distinct impression, for the mind is not always receptive. A man may read a circular, or he may toss it into the scrap basket. The daily newspaper, however, he buys voluntarily, because he wants to read it. He may not read my advertisement the first day or for many days, but some day he will read it and will take it in. That is why I regard the newspaper as one efficient medium of publicity."—Philadelphia Record.

In 1819, the Savannah, propelled partly by steam, partly by sail, traversed the Atlantic in 26 days. In 1833 the voyage was made under steam alone and required 17 days. The voyage to-day is accomplished in six days or less. The largest ships formerly displaced less than 2,500 tons and now displace 15,000 tons or more. The Oceanic's tonnage is 17,274; the Celtic's is 20,904. Coal gas was first used for lighting houses in 1797. The first telegraph line dated

from 1838; the first submarine cable (Dover-Calais) from 1851. Electricity was first generated by steam engines in 1831.

Suit has been commenced in the circuit court by James Offard through his attorney, Stephen A. Graham, against the Pawnee Boat Co., for \$10,000. Offard alleges that on May 29, 1901, he was working on the barge J. R. Edwards, which is owned by the company, as a deck hand. He was at work assisting to shift the anchor of the boat. While leaning over the rail of the boat to place a strap the men allowed the anchor to slip and one of the flukes struck him, breaking his leg. He alleges the company was negligent and further claims that his injuries will be permanent. He asks for damages.

The National Association of Marine Engineers is in session at Toronto discussing questions affecting the interests of ship engineers of both lake and ocean marine, objected to the custom of issuing temporary certificates and this the association will seek to have abolished on the ground that it does injustice to licensed engineers. It is proposed also to ask that British vessels sailing in Canadian waters which are increasing in number, be required to carry the same number of certified engineers as Canadian vessels. The government will also be asked to prohibit the operations of tug boats which do not employ licensed engineers.

Government Proposals.

U. S. ENGINEER OFFICE, Buffalo, N. Y., February 1, 1902. Sealed proposals for removal of wreck in harbor at Buffalo, N. Y., will be received here until 11 a. m., March 4, 1902, and then opened. Information furnished on application. T. W. Symons, Major Engineers. 6-9

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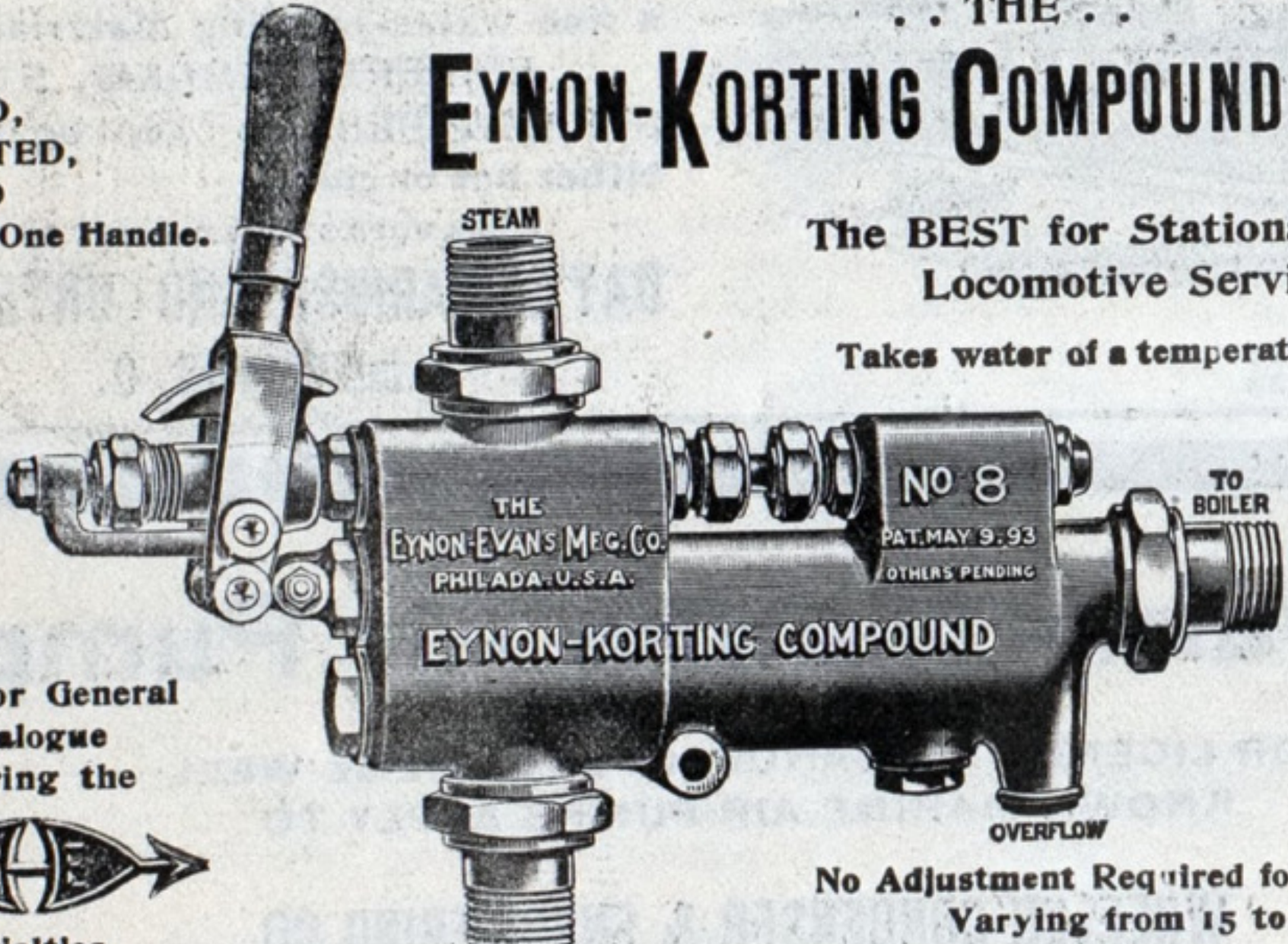
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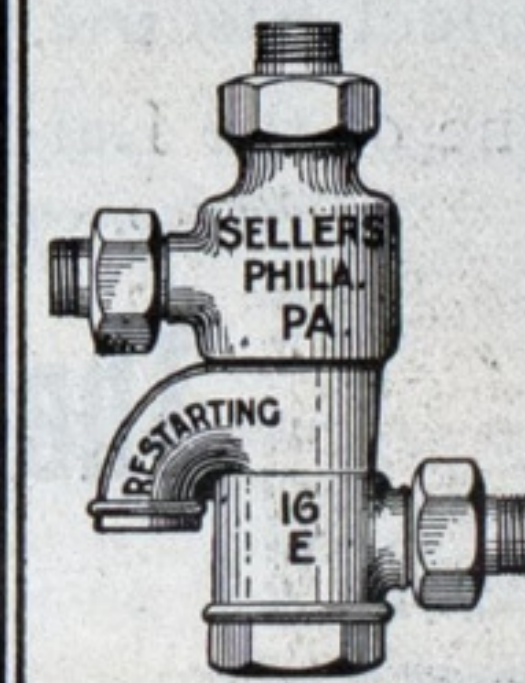
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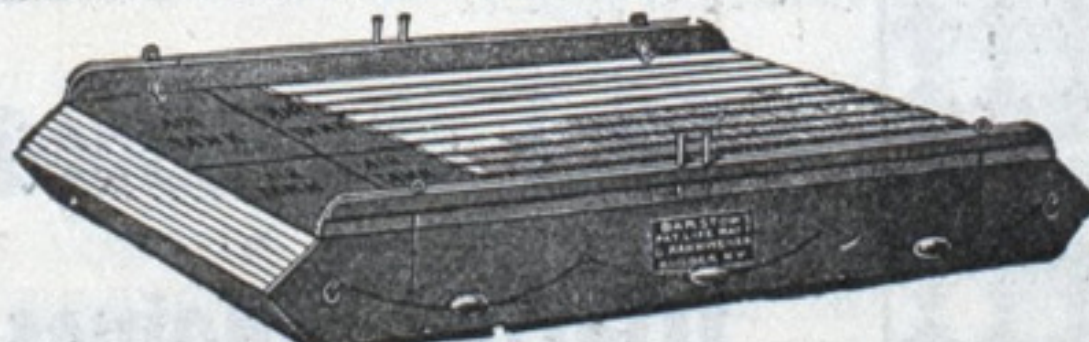
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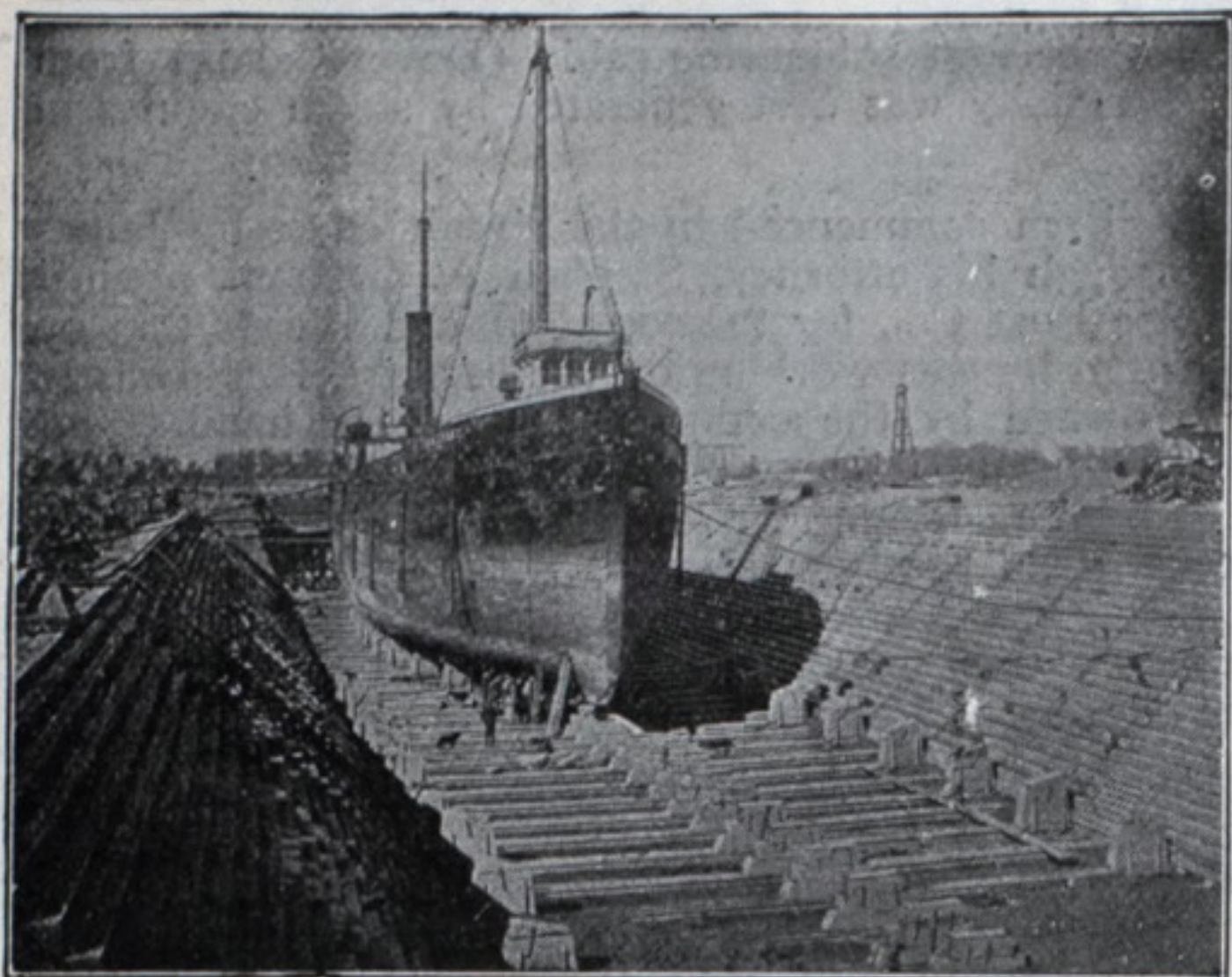
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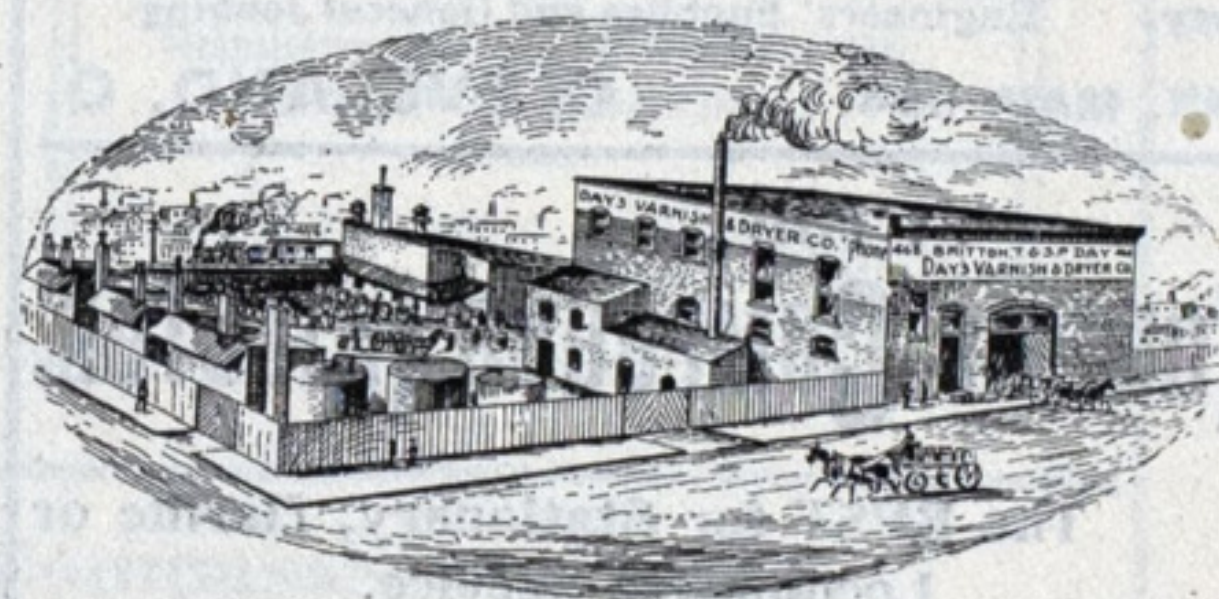
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